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PRESTIGE

FOR THE VETERINARIAN

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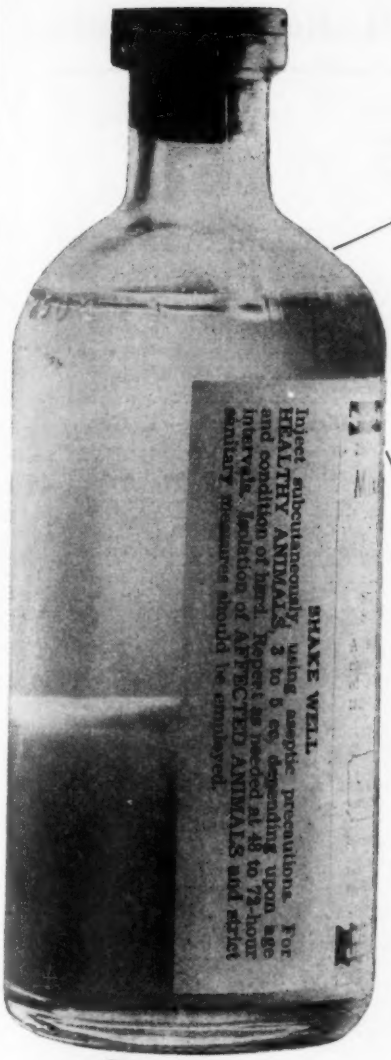

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Journal of the American Veterinary Medical Association

CONTENTS

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VOL. XCVII DECEMBER 1940 NO. 765

A Review of AVMA Activities*

A. E. WIGHT, M.D.V.
President, American Veterinary Medical Association

THE IMPORTANCE of having a strong association, composed of veterinarians of this hemisphere, is emphasized in times such as we are now experiencing. The AVMA has a total membership of over 6,200, of which 62 per cent are engaged in practice and 38 per cent are employed by commercial concerns, the federal, state and municipal governments, in research and in education. It is gratifying to note that about 90 per cent of the 1940 graduates have become members.

The Association has been in existence since 1863, and the 77th annual convention was recently held in the capital of the nation. The interest shown in and the attention given to that convention indicate clearly the importance of this great organization.

PUBLICATIONS

A monthly journal is published to give the members important information on matters pertaining to our profession. Not only is it widely read by the members of our profession, but it at times attracts attention of the general public as well. In this connection, credit must be given to L. A. Merillat, executive secretary of the Association and a prominent veterinarian of this state, whose untiring efforts have resulted in building up the JOURNAL, as well as the membership.

The Association has undertaken to publish a quarterly periodical entitled the American Journal of Veterinary Research, the first issue of which has now been mailed. The results of the publication of this additional journal should be a matter of much interest to the members.

ONE PHASE OF ASSOCIATION'S PUBLIC RELATIONS PROGRAM

Among the Association's objectives is the promotion of science and art in veterinary medicine and its related branches. Stressing the importance of animal products and animal health to human welfare is another objective. The latter is of importance at all times, but more so at this time. The food and work animals of our country have a tremendous value and their health must be protected.

In speaking of the economic importance of our food and work animals, it is interesting to note that the total estimated value of the horses, mules, cattle, swine and sheep in Illinois on January 1, 1939, was approximately $254,000,000, as reported in *Agricultural Statistics*. In addition to this vast sum the poultry in your state is valued at about $16,000,000. The veterinarians of Illinois not only have important duties in the protection of the health of all this live stock, but quite a number are, of course,

*Presented at the 21st annual veterinary conference of the University of Illinois, Urbana, Ill., October 22, 1940.

interested in the control of disease in small animals, including all types of pets.

STATE MEDICINE

It is not uncommon to note and to hear comment regarding the relation of public veterinary service and state medicine as it pertains to the private practicing veterinarian of this country. An excellent editorial on this subject appears in the October number of the JOURNAL, and I take the liberty of quoting from it the following statements:

> The interest of private practitioners does not lie in quarreling with the public service, but in coöperating with it. The system of animal-disease control in the United States has earned nationwide and worldwide approval. It has become a recognized public necessity which has uplifted veterinary practice to a level that could not have been attained unaided. Working in and with the public service is the private practitioner's inevitable destiny. Aided as he now is by excellent diagnostic laboratories, in view of the increasng importance of domestic animals, the private or semi-private practitioner is destined to become an indispensable functionary. Patience, sound thinking and teamwork, with public welfare as the objective, are instruments to use.

WASHINGTON SESSION

The attendance at the convention held in Washington this year was greater than at any previous event of this kind. The literary program, which covered a multitude of subjects on veterinary science, attracted much attention and the various clinics were well attended.

NEW CONSTITUTION AND BY-LAWS

One of the most important actions taken at the meeting was the adoption of the new constitution and administrative by-laws. The provisions of the new constitution are deemed to be an improvement over those contained in the old one, and the by-laws are clearer than the former ones. We are grateful to the members who devoted their time in the preparation of these documents. They also prepared a code of ethics which was adopted with a few changes.

DOG-FOOD TESTING

Our association in coöperation with the American Animal Hospital Association has a plan whereby dog foods can be tested and the product awarded a seal of approval if found satisfactory. This program has been a coöperative project of the two associations for a little more than a year.

RABIES

The subject of rabies has been given considerable attention by our association in recent years. This disease affects not only dogs, but all warm-blooded animals as well, including important food animals such as cattle and swine. The special Committee on Rabies for 1940 furnished a comprehensive report which was approved in its entirety by the Executive Board, and a policy concerning the control and eradication of the disease was recommended by the Board to the House of Representatives. The policy was adopted and details concerning it can be found in the October issue of our journal, page 416.

VETERINARY EDUCATION

There are ten approved colleges of veterinary medicine in the United States, and in recent years about 450 veterinarians have been graduated from these institutions each year. It has been advocated that a branch of veterinary medicine be established at the University of Illinois, and I am pleased to take this opportunity to endorse the proposal in view of its importance to the livestock industry in this state, as well as to the welfare of the small animals, including pets.

PUBLICITY

The profession has received much favorable publicity through newspapers, magazines and radio. For example, in Washington on Saturday, August 31, five veterinarians spoke on the Farm and Home Hour about important activities of veterinarians in this country and Canada. This broadcast, which lasted for almost one hour, was heard by at least 3 million people.

An excellent opportunity for bringing public attention to the activities of the

Introducing John G. Hardenbergh

JANUARY 1, 1941, John G. Hardenbergh of Plainsboro, N. J., will become executive secretary, pursuant to his appointment to that office at the Washington session. As announced in the "Proceedings Number" of the JOURNAL (October 1940, page 300), Dr. Hardenbergh replaces L. A. Merillat, who becomes the editor of the Association's periodical publications: the Journal of the American Veterinary Medical Association and the American Journal of Veterinary Research.

John G. Hardenbergh

The accession of Dr. Hardenbergh to that office is the result of a longtime survey of the Association's affairs dating back ten years or more when it became apparent that the ever-expanding importance of veterinary science in the affairs of our country was begging for a corresponding expansion of the profession's labors. The movement took form at the Omaha meeting in 1937 by the appointment of a reorganizing committee of the Executive Board (Bergman, Brumley and Jakeman) authorized to enforce the reforms needed to place the work and the publications of the Association on a higher plane. Several changes and additions were required to accomplish the purpose, the last of which is the accession herein announced.

The new executive secretary was born at Berkshire, N. Y., April 15, 1892. He is an alumnus of the School of Veterinary Medicine, University of Pennsylvania, having graduated with the class of 1916. He has been affiliated with the Gilliland Laboratories, Veterinary Corps of the United States Army (1918-1920), New Jersey Bureau of Animal Industry, The Mayo Foundation for Medical Education and Research, the Walker-Gordon Laboratory Company, Inc., since 1927, and teaches part time at his alma mater. His society memberships include the American Veterinary Medical Association (joined 1918) in which he is a member of the Executive Board, the United States Live Stock Sanitary Association, the American Public Health Association, Society of American Bacteriologists, Association of Milk Sanitarians, of which he was president in 1937, New Jersey Health Officers Association, New Jersey Health and Sanitary Association, Institute of Food Technology, Sigma Xi, and Phi Zeta. He has also served the Veterinary Medical Association of New Jersey as secretary since 1931.

These connections with societies within and allied to the veterinary service are not set down as testimonials, for everyone in the profession knows that Hardenbergh is stepping into a position he is qualified to fill.

(*Continued from preceding page*)

veterinarians in different branches of the profession was afforded by the exhibit on veterinary medicine, sponsored by our association and allied interests, in the Medicine and Public Health Building at the World's Fair in New York. This exhibit, which was shown during both years of the Fair, received much favorable comment. A part of the display is to be placed in the Museum of the Masterpieces of Art Building in Flushing Meadow Park, New York, after the close of the Fair, where it will be seen by large numbers of people.

The World's Reliance upon Veterinary Science*

H. C. BYRD,† B.S., LI.D., D.Sc.
College Park, Md.

. . . . . Farm soil constitutes our greatest natural resource, our richest single asset. Coal, iron, oil and other natural resources we consume and dissipate. Properly managed soil, however, continues to produce abundantly from generation to generation. Olive trees in Italy 1,000 to 1,500 years old are still yielding bountiful crops. In Europe and the Nile Valley, and other regions of the earth, the soil has been under cultivation for more years than we have in recorded history.

How often do we stop to think that the existence of the people of the earth depends upon the common dirt (soil) and that nations measure their wealth by its productivity. It is the essentuality for which the nations are now fighting. . . . . The triumvirate is God, Man and the Soil.

In this triumvirate, the veterinarian plays an important rôle. Many of the products of the soil can not be consumed by man until transformed into usable products by domestic animals. From 75 to 80 per cent of the crops of the farmer is fed to live stock. . . . The efficiency with which animals transform these products governs the profits and the losses of farm operations. . . . . The margin between profit and loss is not great. . . . . It is, however, the difference between success and failure. The 11 bushels of corn that makes 100 lb. of pork selling at 6 cents a pound requires a healthy, fat type of hog to do the transforming. If fed to a "razor-back" the return would not be much above 4 cents a pound.

[This logical comparison depicts corn at 54 cents a bushel with well-managed hogs and but 36 cents a bushel for hogs not raised under intelligent supervision.]

Many of us know farmers who do a fairly good job in production of farm crops but who are gradually going broke because they are marketing these crops through animals incapable of transforming them economically into profitable products.

The dust storms of the past few years forced upon city and farm folks the realization of the imperative need of a soil-conservation program. . . . We have justifiably spent large sums of money on growing alfalfa that will not kill in the winter, on lespedezas that will grow luxuriantly in the heat of summer, and on hybrid corn that yields bountifully in the fall. All of these gains, however, are nullified unless we constantly strive to improve the efficiency of the live stock that consumes them. It is not too visionary to assume that when we breed and manage our hens so that they will average 200 eggs a year, the producer will make more profit than he now does and yet sell to the consumer at a lower price.

The part the veterinarian must play in bringing about a completely profitable agriculture is that of a maintenance engineer. In every large manufacturing plant—agriculture is essentially such a plant—the maintenance engineer is one of the important cogs. His job, among other things, is to repair broken machinery, to replace worn and outmoded tools and equipment, to change economic practices and procedures, and, generally, to see that the plant is running efficiently and profitably. It seems to me that this, also, is the job of the veterinarian. He repairs the injured, removes the diseased, and suggests such changes as will be helpful and profitable to the owner.

It has been said that only those who are making a profit out of their farm operations can afford to hire a veterinarian, but it seems to me that this might be changed just a bit to say that only those who do hire a veterinarian can make a profit out of their operations. . . . No greater job awaits you as a profession than to aid the

*Excerpts from an address delivered before the banquet session of the American Veterinary Medical Association, Washington, D. C., August 28, 1940. The title is ours.

†President, University of Maryland.

more backward farmers and stockmen in developing and maintaining more profitable live stock. . . . The farmer who maintains weed-covered fields and diseased stock jeopardizes his neighbors and his country. He has nothing, expects little, and sells his products at a too-low price, thus beating down legitimate prices and consequently dragging others down to his economic level.

[Here, President Byrd dwelt at length upon the achievement of the BAI which led to the conquering of yellow fever; upon the successful battle against animal plagues which had closed our foreign markets and impoverished our farmers; upon the threat of animal diseases to public health; upon what John R. Mohler has done, not only for the livestock industry, but also for human values; upon the part of the veterinary service, unnoticed by the public, in insuring a safe and ample supply of food for the people; upon the work of Colonel Kelser of the Veterinary Corps, who showed that mosquitoes can spread encephalomyelitis of horses to other animals and human beings; upon the work now being done on influenza (canine distemper and swine "flu") which promises to control that disease in man; upon the utilitarian horse and mule in the field armies of Europe; upon the need of equine medicine keeping step with the other branches of veterinary science.]

RESEARCH

You have facing you today many unsolved problems in your field of work. . . . The answer must come from research, and while research will cost money, it will not be as expensive as to continue the slaughtering of animals. Let us accept the challenge to find a better way to control and prevent.

Research is the effort of man to take greater advantage of the resources of nature that other men may live more abundantly. . . . What has been achieved by research to lighten the labors of mankind is today so commonplace that we accept it without a thought.

[Here, the speaker mentioned the spark Benjamin Franklin brought down the string of his kite that put lights, motors and refrigerators in every home; the work of Pasteur that disclosed the nature of many diseases; the synthesis and use of the vitamins and hormones and the discovery of new and better drugs; the usefulness of animals in the march of medical science; the biological factors involved in meat production; the predetermination of sex in animal breeding; the prospects of artificial insemination which through electro-chemical means may in the future separate the male from the female sperm; the increasing of milk consumption and public health by increasing the productivity of cows and profits to the dairyman.]

The true researcher cares little for the jibes of others, knowing, as he does, that all progress begins with a dream and that some few dreams end in realities that improve the spiritual and physical well-being of mankind. Nothing could be considered more fantastic than if in the lifetime of our grandfathers—some speaker has said that within the lifetime of their grandsons—men would sit in front of a little instrument the size of the hand and speak to the whole world at once, or fly a 50-ton machine through the air at 200 miles an hour.

Your profession has contributed much in the field of research but even more in your interpretation of research to the layman. . . . . The veterinary practitioner in particular has had an important part in spreading the benefits of science to those who most need it and who might not be informed through any other source.

In conclusion, let me express the hope that we shall keep constantly before us the thought that if we are to provide for our people healthful, nutritious food and milk; if we are to protect our human populations against the dangers of animal diseases; if we are to increase the efficiency of our domestic stock so that they can produce more abundantly; if we are to do all the other things necessary to provide an even higher standard of living than now is ours, it will have to be through the coöperative effort of veterinarians, physicians, scientists and livestock breeders. The most valuable ultimate result will have to come through research and education rather than through laws and regulations. The day of the scientist working alone in his secluded laboratory is about over. Our problems are complex and their solutions require the

combined efforts of all branches of science and the successful establishment of a new and desirable practice—that of gifted men writing, speaking and demonstrating to interpret the results of research to the layman.

AN ALLEGORY ON COÖPERATION

When you are served a tender, juicy steak, to whom should you give credit—the geneticists who, through selective breeding, developed the type; the agronomist who cultivated the soil and plants on which the animal was fed; the farmer who raised the animal; the veterinarian who protected its health; or the cook who prepared it for the table? Any one of these individuals could have spoiled it, but all had to work together intelligently and harmoniously that we, the public, might enjoy it.

In working together, in this kind of coöperation, lies the hope of man for a higher estate, lies the essence of whatever progress man is to make in further lightening his labors; in gaining more of the necessities of life and in providing more time for the pursuit of leisure in which we may realize greater developments and achieve a finer appreciation of life.

In contributing toward these ends, you who are here tonight are collaborators in the great constructive work of the world.

Salmonella Infections

When workers in the U. S. Bureau of Animal Industry (Salmon, Smith and associates) were studying the pathogenicity of the organism then known as the hog-cholera bacillus nearly 50 years ago, they gave birth to the name of a genus of bacteria now known as Salmonella which was chosen years later in honor of the distinguished chief under whom these pioneers were laboring in the attempt to solve the troublesome problem of hog cholera—one among other grave diseases threatening the food supply of the country which led to the founding of that bureau and the development of the present veterinary service.

It could not have been predicted at that time that these studies would become the basis for the classification of four or more score of bacteria of tremendous importance in human and animal medicine, particularly in connection with numerous human infections for which domestic animals are the main reservoirs — carriers. Being found only in lesions of their own making, the Salmonellae are true pathogenic parasites (Salvage) and (at least for *S. suipestifer*) parenteral inoculation is negative (Murray, 1934). Transmission is alimentary. In recent years, the genus was brought into the foreground of pathology through establishing its relation to swine enteritis, pullorum disease and, later, food poisoning in man. In the latter rôle, the subject is one of immense importance in the meat-inspection work of the veterinary profession, although in this country it has not attracted as much general interest on that score as in Europe, where the slaughtering of meat animals *d'urgence* to salvage them appears to account for the difference.

The species and varieties of Salmonella in animals are numerous and the diseases they produce are economically grave, but on the public health side much remains to be considered, judging from the difference between American and European literature.

The species *pullorum, suipestifer, abortus equi, enteritidis, paratyphus* B, *typhimurium* of ducklings, etc., make up a group of transmissible microbes affecting man, fowls, swine, horses, and other domestic mammals which were brought into prominence through the early studies of hog cholera in the United States, and which, after nearly a half century, still belong to "diseases of the future" needing the watchful attention of veterinary science.

Only 2.7 per cent of the 25 million milk cows in the United States are found in dairy-herd-improvement associations.

Feeding the sick by injecting nutritive material directly into the veins is announced as a new medical achievement. The object is to sustain life through periods of suspended alimentary action.

An Effective Treatment for the Control of the Sheep Head Grub, Oestrus Ovis, in Areas Where the Winters Are Cold*

N. G. COBBETT, D.V.M.
Las Vegas, N. Mex.

THE LARVAE of *Oestrus ovis* infest the cavities of the heads of sheep in practically all parts of the world where sheep are raised. Although such infestations are not known to cause any considerable death loss, except perhaps in cases of unusually heavy infestation, the presence of these larvae is undoubtedly detrimental to the health of sheep. The clinical symptoms in sheep infested with the grubs are so noticeable and at times so alarming, that many fatalities due to other causes are ascribed to these infestations. The adult form of the parasite, the sheep botfly, is of economic importance to the sheep industry, since the activity of the fly causes fear and restlessness among sheep and thus interferes with their well being.

How Grubs Are Acquired

Sheep become infested with the grubs during warm days when the botflies are active. The female flies are viviparous and deposit minute living larvae in the sheep's nostrils. The minute grubs move immediately into the nasal passages and, after remaining on the nasal mucous membranes for varying periods, they migrate to the frontal sinuses where they complete their development as larvae. The mature larvae then migrate to the nasal passages and drop to the ground where they burrow into the soil and pupate. At the end of the period of pupation, which lasts from approximately 3 weeks to 2 months, depending upon the temperature and moisture conditions of the soil, the adults emerge from the pupal cases, crawl to the surface of the ground and become active.

Previous Work on Treatment

A review of the literature shows that many attempts have been made to treat or prevent grub infestation of sheep. These attempts have involved (1) efforts to kill the grubs in the frontal sinuses of the head by injecting materials into them through surgical perforations of the frontal bones; (2) by injecting medicinal preparations into the nasal passages; (3) by introducing irritants into the nasal passages for the purpose of causing the infested animal to sneeze and expel the grubs by force; and (4) by placing repellents around the nasal openings to prevent the deposition of larvae by the flies. These types of treatment were reported by Curtice,[1] and his references to and quotations from authors antedating him by many years show that even then the subject of grub infestation of sheep had received considerable attention.

In recent years attempts to develop satisfactory treatment for head-grub infestations of sheep have been revived. Gildow and Hickman[2] described a treatment which consisted of the introduction of 3 cc. of a mixture of equal parts of carbon disulfide and light mineral oil into the nasal passages. The success of the treatment depended upon the medicament reaching the grubs in the frontal sinuses. In order to insure this result, the head of the sheep was laid on its side so that the median septum was parallel to the horizontal plane. The medicament was then injected into the middle nasal meatus, whence it was allowed to drain into the foramina leading to the frontal sinuses. Stewart[3] stated that head-grub disease had been treated in Australia for many years without trouble or risk. The treatment described by Stewart con-

*From the Zoölogical Division, Bureau of Animal Industry, U. S. Department of Agriculture.

[1]Curtice, C.: The animal parasites of sheep. U. S. Dept. Agr., Bur. Ani. Ind. (1890).

[2]Gildow, E. M., and Hickman, C. W.: A new treatment for *Oestrus ovis* larvae in the head of sheep. J.A.V.M.A., lxxix (Aug. 1931), n. s. 32 (2), pp. 210-216.

[3]Stewart, J. R.: Treatment for *Oestrus ovis*. J.A.V.M.A., lxxx (Jan. 1932), n. s. 33 (1), p. 108.

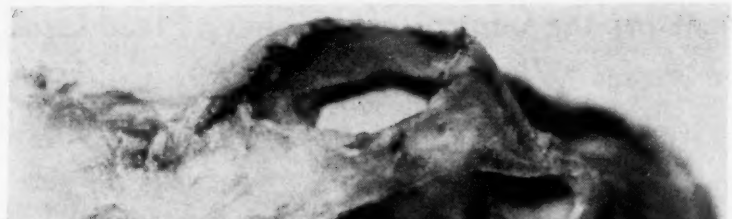

Fig. 1. Dorsal view of right half of skull of mature sheep, with part of frontal bone removed to show frontal sinus. (Arrows denote location of entrance of naso-frontal foramina.)

sisted of puncturing the frontal bones and injecting 2 cc. of a solution (nature of solution not stated) through the perforation into the sinuses. Du Toit and Clark[4] described a treatment similar to that outlined by Stewart. The technic of the operation was fully described and the authors noted that they observed no deleterious effects resulting from the dead larvae in the sinuses. They noted further that when sheep were examined at necropsy a few days after treatment, no dead larvae were found in the sinuses. Mitchell and Cobbett[5] demonstrated that the application of pine tar to the noses of sheep was of little value in preventing infestation. Du Toit[6] reported that carbon bisulfide, carbon tetrachloride and tetrachlorethylene were equally effective in the treatment of head-grub infestation when injected into the head cavities through surgical perforations into the sinuses, and stated that an emulsion of tetrachlorethylene had proved satisfactory as a remedy. In addition to the operative treatment described, Du Toit further reported that tetrachlorethylene emulsion was effective in killing the small larvae in the nasal passages when the emulsion was injected into the nostrils, while the infested animal was restrained on its back with the head held at an angle of about 45 degrees with the ground.

[4]Du Toit, R., and Clark, R.: The sheep nasal fly. A method of treatment for sheep infected with larvae of *Oestrus, ovis*. J. South African V.M.A., vi (March 1935), pp. 25-32.

[5]Mitchell, W. C., and Cobbett, N. G.: Field investigations relative to the control of *Oestrus ovis*. J.A.V.M.A., lxxxiii (Aug. 1933), n. s. 36 (2), pp. 247-254.

[6]Du Toit, R.: The external parasites of sheep. Farming in South Africa, xiii (Oct. 1938), 151, pp. 401-404, 407.

PRESENT WRITER'S WORK

Biological Observations.—The investigations which led to the development of the treatment herein described were conducted at Las Vegas, New Mexico, during the period of 1933 to 1937. The data collected through year around observations amongst range sheep and from numerous necropsies of the heads of sheep showed that sheep botflies were active in New Mexico only during the late spring, summer, and early fall. During the investigations it was demonstrated that many *Oestrus ovis* larvae developed to maturity in and were expelled from the head cavities of spring lambs in 25 to 35 days. It was further observed, however, that many minute larvae which were deposited in the nostrils of sheep during the botfly season did not develop during that season. These small grubs remained on the nasal mucous membranes throughout the late fall and winter months and did not migrate to the frontal sinuses (fig. 1) for further development until the following spring. The larval infestation found in the heads of New Mexico sheep during the late fall and winter consisted principally of small grubs located in the nasal passages; very few grubs were found in the frontal sinuses during that time. When these observations are considered in conjunction with existing knowledge concerning the life history of the nose botfly, it appears likely that this species

overwinters as small larvae in the nasal cavities of the host.

It was apparent from the findings described in the preceding paragraph that *Oestrus ovis* could be controlled in New Mexico and other areas where the winters are cold by destroying the minute larvae that inhabit the nasal passages of sheep during the late fall and winter months. Numerous experiments were conducted with the object in view of developing a practical and effective method of killing these minute larvae in the infested sheep. Various larvicides in the form of gases, powders, unguents, sprays, and solutions and many methods of introducing them into the nasal passages of sheep were tried. The nasal-mucous secretions and the intricate folds and crevices formed by the interior nasal structures (fig. 2) provide protection to the larvae on the nasal mucosa. Therefore, it was necessary to find a larvicide that would penetrate and mix with the secretions and to devise a method of medicating effectively all of the mucous surfaces involved.

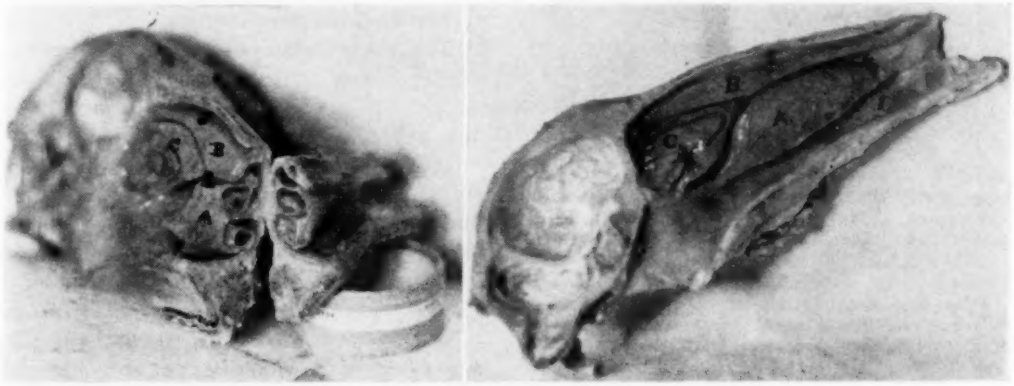

Fig. 2. Two views of left nasal passage and associated structures, with septum nasi removed (yearling sheep). The view at the left is a transverse section at the first molar. A) Ventral turbinate; B) dorsal turbinate; C) middle turbinate; 1) ventral meatus; 2) middle meatus; 3) dorsal meatus.

Technic of Treatment with Saponified Cresol.—Of the various medicaments tried, solutions of saponified cresol* gave the best results. The method and technic of irrigating the nasal mucous membranes finally adopted were determined by injecting a tissue staining solution into the nostrils of sheep by various methods while the heads of the sheep were held in different positions. The results of such irrigations were determined by killing the sheep and observing the color of the nasal membranes. It was observed that the nasal mucosa was most completely stained in heads that had received the staining solution in a small stream, backed by considerable air pressure (35 to 40 pounds per square inch), while the head was held on the dorsal surface with the muzzle slightly elevated. The more thorough irrigation thus obtained was due principally to two factors: 1) the pressure behind the liquid forced along the nasal meati between the turbinate bones and into the folds and crevices of the turbinates, and 2) the gravitation of the solution over the interior nasal structures which, when the head was held on the dorsal surface (fig. 3), were lower than the course of the injected liquid.

Effect of Treatment.—Aqueous solutions containing 1 to 9 per cent of the saponified cresol were tried in the preliminary treatments of infested sheep. The irrigation of the nasal mucous membranes of sheep with solutions of the product caused irritation of the tissues, giving rise to spasmodic sneezing and coughing and a flow of mucus from the nostrils. The intensity and duration of these reactions increased proportionately with the strength of the solution used. Symptoms of toxicity appeared when solu-

*In the tests discussed in this paper lysol was used.

tions containing over 7 per cent of the saponified cresol were administered.

Postmortem examinations of treated sheep showed that the larvicidal action of solutions containing less than 2 per cent of the saponified cresol were not as effective as those containing between 2 and 3 per cent. The larvae were killed just as effectively, however, by a 3 per cent solution as they were by stronger solutions of the product. The necropsies showed that

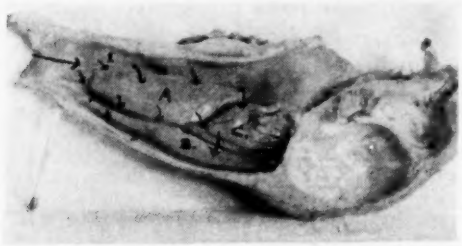

Fig. 3. Medial view of left nasal passage and associated structures, with septum nasi removed (yearling sheep). A) Ventral turbinate; B) dorsal turbinate; C) middle turbinate; 1) ventral meatus; 2) middle meatus; 3) dorsal meatus. (Arrows indicate approximate course taken by liquid injected into nostril when head is held on dorsal surface with muzzle slightly elevated.)

the naso-frontal openings were unusually large in the heads of a few of the treated animals. In such cases the solution entered the frontal sinuses and where there was infestation in these cavities the medicament killed the large as well as the small grubs.

DATA ON RESULTS OF TREATMENT

Following the preliminary treatments of sheep with solutions of the saponified cresol, solutions containing 2 and 3 per cent of the product were used in a series of experiments on a number of feeder sheep which were to be slaughtered for local consumption. The sheep involved consisted of spring lambs, yearling wethers, and aged ewes which were from the same band of range sheep and were fattened on the ranch where they were raised. Thus the treated and untreated sheep had been equally exposed to infestation during botfly season. The treatments were administered during the late fall or early winter months and the head cavities of the treated and untreated animals were examined at the time of slaughter, which necessarily was governed by the fitness of the sheep for slaughter and the local demand for the meat.

With the exception of the last experiment in the series, the number of animals taken from the control groups for slaughter was less than that from the treated groups. However, each lot slaughtered contained both treated and control sheep and the average number of grubs per animal found in the heads of the treated sheep as compared to that found in the heads of the untreated animals indicated the effectiveness of the treatments.

The data relative to the treatment of feeder sheep with solutions of the saponified cresol are recorded in the accompanying table. The percentage of infestation that was eliminated in the treated sheep by the single and the double treatments, the latter given five days apart, using 2 and 3 per cent solutions of the saponified cresol, is shown in the last column of the table. The higher percentage of grub elimination which resulted from the single treatment with a 3 per cent solution of the saponified cresol in the last experiment of the series probably was due to improved equipment which had been developed for administering the treatment.

The irrigation of the nasal mucous membranes of sheep with solutions containing 2 or 3 per cent of the saponified cresol resulted in no injury to the animals. The spasmodic sneezing and coughing occurred only immediately following the application of the treatment and the subsequent nasal discharge was of short duration. Occasionally an animal held its breath immediately following treatment and fell to the ground. Such animals, however, made an uneventful recovery when promptly assisted to their feet. It was essential to administer the treatment quickly and release the animals immediately to prevent possible strangulation. Approximately 1 fluid ounce of the saponified cresol solutions was injected into each nostril.

It should be remembered that the treatment of sheep for *Oestrus ovis* larvae, de-

Data Relative to the Experimental Treatment of Sheep with Saponified Cresol Solutions

Experiment	Treatments Given	Strength of Solution Used (%)	Dates Treated	Period When Examined	No. Treated Sheep Examined	No. Untreated Sheep Examined	Total No. Grubs in Treated Sheep	Total No. Grubs in Untreated Sheep	Average No. Grubs per Animal in Treated Sheep	Average No. Grubs per Animal in Untreated Sheep	Per Cent Grubs Eliminated by Treatment
1	2	3	(1936) January 15 and 20	(1936) Feb. 5 to Apr. 7	6	5	1	52	.17	10.4	98
2	2	2	(1936) January 22 and 27	(1936) Jan. 28 to June 3*	70	35	91	303	1.3	8.7	85
3a	1	3	(1936) November 16	(1937) Jan. 2 to May 18	27	27	63	295	2.3	10.9	79
3b	1	2	(1936) November 16	(1937) Jan. 2 to May 18	27	27	120	295	4.4	10.9	60
4	1	3	(1938) November 30	(1938-39) Dec. 3 to Feb. 4	30	30	84	676	2.8	22.3	88

*The examinations of sheep in the second experiment were terminated on June 8, 1936, when newly deposited larvae were found in the nasal passages of both the treated and untreated sheep involved.

scribed herein, is effective as a control measure only in areas where the winters are cold. The prolonged cessation in the development of the minute first-stage larvae within the nasal passages of sheep and the absence of botfly activity throughout the late fall and winter months are known to occur only in such areas. Any period of cessation in the life cycle of *Oestrus ovis* that might occur in areas where the winters are warm or moderate would probably be of insufficient duration to make possible the control of the parasite by the treatment described herein unless the treatment was applied at frequent intervals, which probably would be impracticable except in small flocks of sheep.

Summary and Conclusions

1) The infestation of sheep with the larvae of *Oestrus ovis* has been reported from all parts of the world where sheep are raised. Although such infestations as commonly occur in the head cavities of sheep are not known to cause any considerable death loss, the presence of the larvae is undoubtedly detrimental to the health of infested animals. The persistent efforts of the sheep botfly to deposit its larvae in the nostrils of sheep seriously interfere with the proper handling and grazing of the animals.

2) A review of the literature relative to *Oestrus ovis* shows that the parasite has been recognized as a problem confronting the sheep industry for many years and that many attempts have been made to treat or prevent grub infestation of sheep.

3) In areas where the winters are too cold for the vitality of the sheep botfly or the other extra-host stages in the life cycle of *Oestrus ovis*, the survival of the species from year to year is dependent upon some of its first-stage larvae which winter over in the nasal passages of sheep. These minute grubs remain in a quiescent state of development on the nasal mucous membranes throughout the late fall and winter months and do not migrate to the frontal sinuses for further development until early spring. In such areas during late fall and winter the grub infestation of the heads of sheep is composed almost entirely of the minute larvae in the nasal passages. Therefore, the effectiveness of the treatment of sheep for *Oestrus ovis* described herein depends upon destroying the minute first-

stage larvae in the nasal passages of infested sheep during the late fall and winter months.

4) Since the minute larvae in the nasal passages of sheep are well protected by the mucous secretions and the conformation of the nasal turbinates it is difficult to destroy all the larvae present.

5) A 3 per cent solution of saponified cresol (lysol) is an effective remedy for destroying the minute larvae of *Oestrus ovis* on the nasal mucosa of sheep.

6) The method of applying the treatment was to force a small stream of the saponified cresol solution, backed by 35 to 45 pounds of air pressure, into the nasal passages of sheep while the head of each animal was held on the dorsal surface with the muzzle slightly elevated. By thus injecting about 1 fluid ounce of the medicament into each nostril of infested sheep approximately 90 per cent of the existing infestation was eliminated by one treatment and two such treatments, administered 5 days apart, eliminated 98 per cent of the existing infestation.

7) The treatment caused temporary irritation of the mucous membrane involved, giving rise to spasmodic coughing and sneezing and a flow of mucus from the nostrils of treated animals. No injury resulted when the treatment was administered quickly and the treated animals were released promptly.

Listerellosis in Sheep and Cattle

Diseases caused by organisms of the genus Listerella have been recognized for but a short time. An intense monocytosis in laboratory animals (rabbits and guinea pigs) due to the Gram-positive *Bacterium monocytogenes* was described in 1926 by Murray, Webb and Swan. The same organism was isolated in the cerebrospinal fluid of man by Nyfeldt (1929-1932), by Shultz, Terry, Brice and Gebhardt in California (1934), and by others in 1935, 1936, 1938 and 1939.

In 1931, Gill of New Zealand classified circling disease of sheep as a listerellosis, and Doyle of Purdue University described an encephalitis of sheep that was probably due to a Listerella. Others who have identified the disease in sheep are Ten Broeck of New Jersey; Olafson of New York; Jungherr of Connecticut; Graham, Dunlap and Brandly of Illinois, Missouri and Michigan, respectively; and Biester and Schwarte of Iowa.

In cattle the disease has been described by Fincher and Olafson (New York, 1935-1936) and by Graham, Hester and Levine (Illinois, 1938-1939). Cromwell, Sweebe and Camp isolated the organism in foxes and Ten Broeck (New Jersey, 1935), Patterson (1937) and Watkins (England, 1939) identified the disease in poultry.

Graham, Hester and Levine studied three epizoötics of listerellosis in sheep and four in cattle, which were manifested by encephalitis and encephalomyelitis. The period of incubation is not known, the morbidity was 10 to 15 per cent and the mortality high.

Canine Distemper in Man

Guess work in medicine is generally harmful when it gets into print and lives to raise a chuckle in coming years. In 1929, for example, a capable veterinarian wrote: "It requires a truly imaginary mind to envisage a relationship between any of them [virus diseases], least of all canine distemper, which man escaped since Noah turned a pair of dogs loose on Ararat."

In 1933, or just four years later, Nicolle in Algeria demonstrated that man can have canine distemper in inapparent form and when experimentally infected his blood is virulent for susceptible dogs.

A rapid field method of detecting the leucopenia of the early stage of hog cholera as an aid in diagnosis is said to be in the offing.

The reason the body does not need a large intake of iron is that iron is used up again and again. When released by the red cells, iron goes to the marrow for another journey to the blood.

A Method of Large-Scale Treatment of Sheep for the Destruction of Head Grubs (=Oestrus Ovis)*

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Las Vegas, N. Mex.

As far as is known the first large-scale treatment of sheep for the control of *Oestrus ovis* in this country was conducted near Las Vegas, New Mexico, in November 1936. At that time three flocks of range sheep comprising approximately 6,700 animals were treated. The object of the work was to develop an effective and practical method of applying the saponified cresol solution treatment to large numbers of sheep. From the experience and information gained in the original and subsequent large-scale treatments of New Mexico range sheep the method of applying the treatment as herein described was evolved.

The treatment referred to was developed for the purpose of destroying the minute first-stage larvae of *Oestrus ovis* which inhabit the nasal passages of sheep during the fall and winter months in areas where the winters are cold. In such areas the minute larvae remain quiescent on the nasal mucous membranes of sheep throughout the fall and winter and do not migrate to the deeper head cavities of the host for further development until early spring. Thus the existence of the species from year to year in such areas is dependent upon the survival of these small grubs.

In tests conducted with butcher sheep during the development of the saponified cresol solution treatment, it was demonstrated that one application of the treatment was effective in eliminating approximately 90 per cent of the total existing infestation from the heads of treated sheep and that two treatments, administered 5 days apart, eliminated 98 per cent of such infestation.

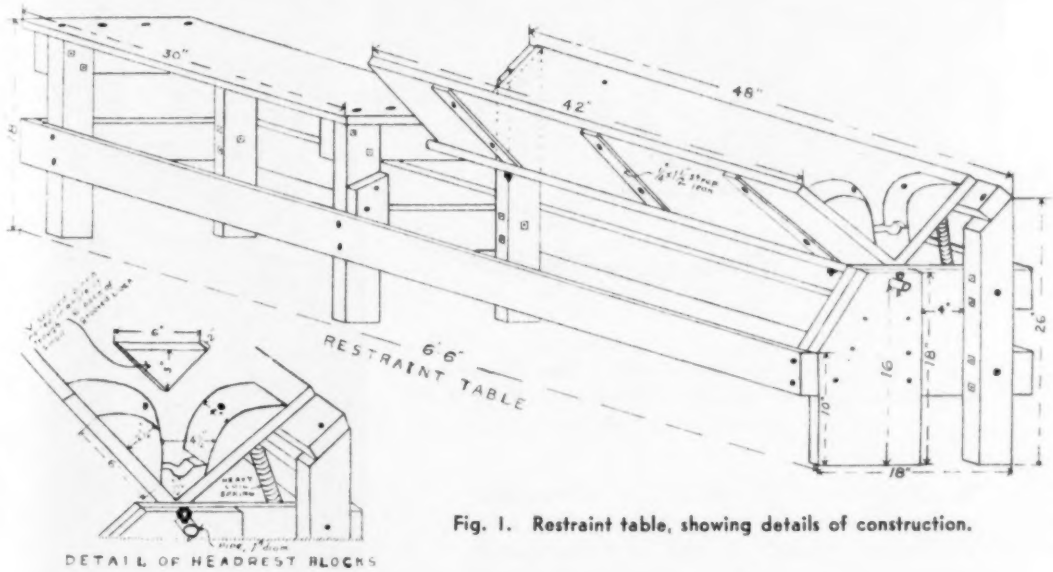

Fig. 1. Restraint table, showing details of construction.

Materials, Methods and Apparatus Used

The treatment consists of irrigating the nasal mucosa of infested sheep with a 3 per cent solution of saponified cresol. This

*From the Zoölogical Division, Bureau of Animal Industry, U. S. Department of Agriculture.

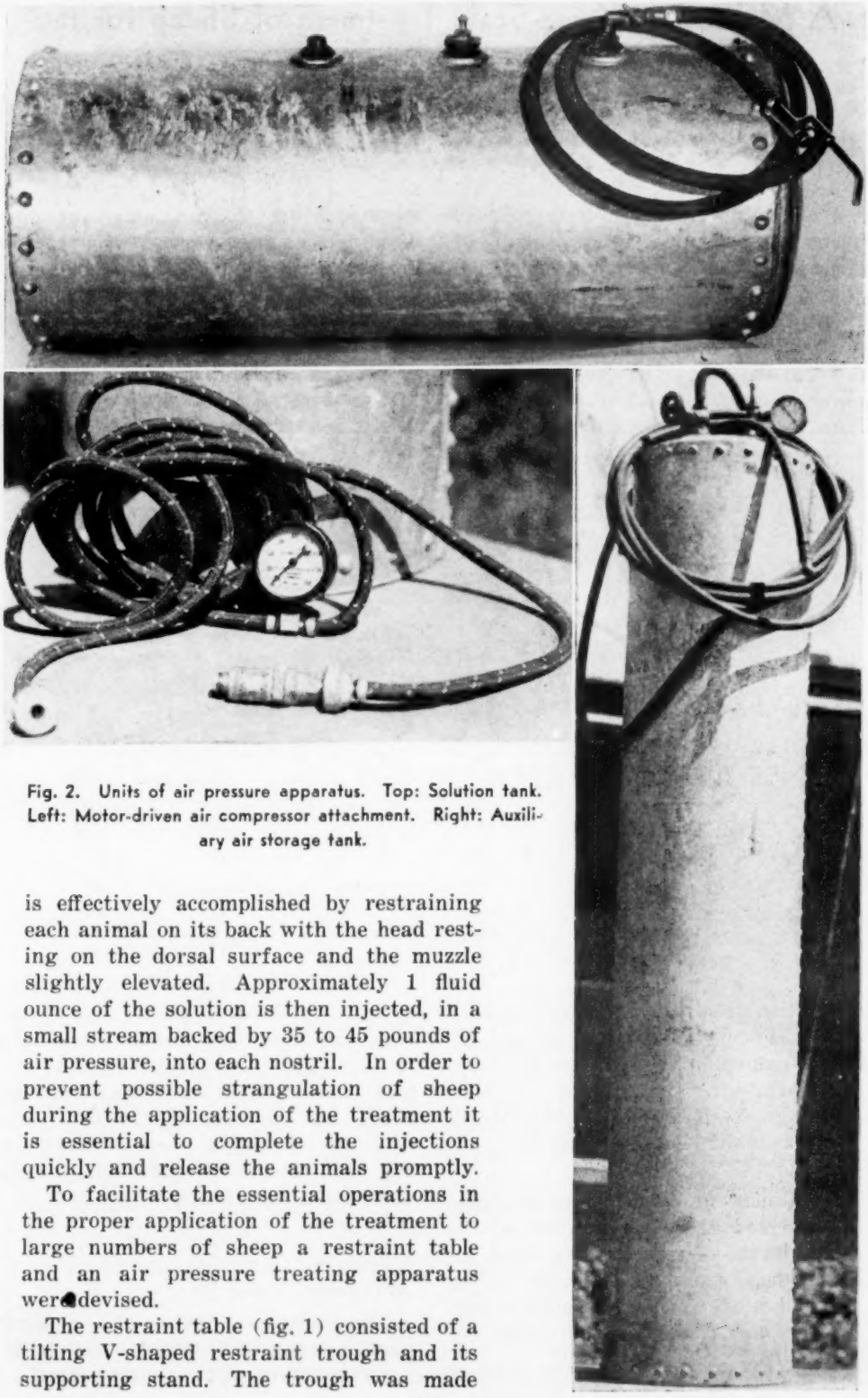

Fig. 2. Units of air pressure apparatus. Top: Solution tank. Left: Motor-driven air compressor attachment. Right: Auxiliary air storage tank.

is effectively accomplished by restraining each animal on its back with the head resting on the dorsal surface and the muzzle slightly elevated. Approximately 1 fluid ounce of the solution is then injected, in a small stream backed by 35 to 45 pounds of air pressure, into each nostril. In order to prevent possible strangulation of sheep during the application of the treatment it is essential to complete the injections quickly and release the animals promptly.

To facilitate the essential operations in the proper application of the treatment to large numbers of sheep a restraint table and an air pressure treating apparatus were devised.

The restraint table (fig. 1) consisted of a tilting V-shaped restraint trough and its supporting stand. The trough was made

by bolting two 1" x 12" x 42" oak boards to three right-angle braces made of heavy strap iron. Wooden blocks were nailed into the outer end of the trough so as to form a head rest to facilitate holding the sheep's head in the proper position during treatment. The trough was bolted to an iron pipe axis running lengthwise beneath it. The ends of the pipe axis were supported by and revolved in holes drilled through the center cross brace and outer end support of the stand, allowing the trough to be tipped to one side. The frame of the supporting stand was constructed

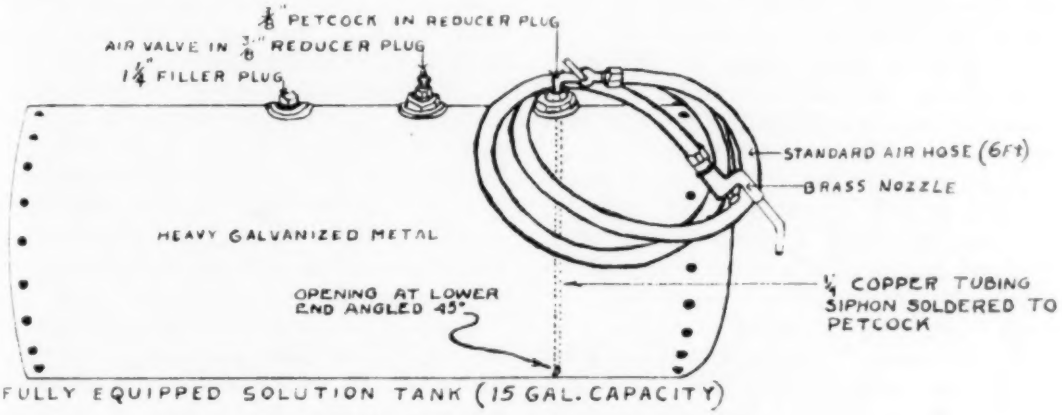

Fig. 3. Solution tank, showing details of construction.

of 2" x 4" lumber fastened together with bolts. Its front end support and rear platform were made of 1" lumber.

Upon completing the treatment of a sheep the trough was tipped to one side, thereby discharging the animal onto its feet. The trough, when relieved of the weight of an animal, was immediately pulled to its original position by a strong coil spring attached to the frame of the stand.

The air pressure apparatus (fig. 2) consisted of a solution tank, auxiliary air storage tank, a motor-driven air pump attachment for compressing air in the auxiliary tank, lead-off and a nozzle for injecting the solution into the nostrils of sheep. Ordinary hot water tanks of heavy gauge metal were used. The solution tank (fig. 3) was of 15-gallon capacity and had three 1¼" threaded side openings. The tank was charged with solution through one opening which was then closed with a threaded metal plug. The other openings were fitted with threaded metal reducer plugs. Into one of these was soldered an ordinary tire valve stem which was used as an air intake valve. The other opening was fitted with a ⅜" petcock. A siphon tube, made of ¼" copper tubing, was soldered to the base of the petcock and extended into the tank to within one-fourth inch of the opposite wall. A six-foot length of standard ¼" air hose connected to the petcock was used as a discharge hose. The nozzle which was attached to the free end of the hose is marketed under the designation "air blow gun" and has a curved neck about 3 inches long and 5/16" in diameter. The point of the neck is blunt and has an effluent opening measuring 3/32" in diameter. The flow of solution from the nozzle was controlled by pressing or releasing a button which opened and closed a valve in the base.

The auxiliary air storage tank of 30-gallon capacity was equipped with an air intake valve and an effluent petcock. Air pressure was maintained in the auxiliary tank by means of a motor driven air compressor attachment which delivered air from a spark plug chamber of an automobile engine to the tank. The tanks were connected by a 25-foot length of standard ¼" air hose. The restraint table, when in use, formed one wall of a catch pen and was placed so that the tilting trough discharged the treated sheep to the outside of the pen. During large-scale operations two restraint tables were placed end to end

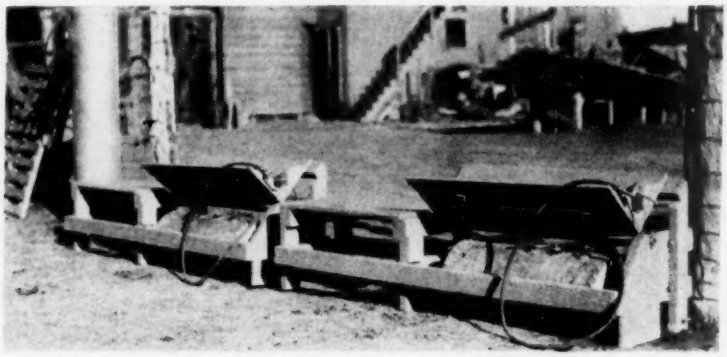

Fig. 4. Relative position of two restraint tables and solution tanks as used in treating large numbers of sheep.

(fig. 4). A solution tank was placed lengthwise beneath the tilting trough of each table. The tanks were not completely filled with solution, space being left for compressed air. Satisfactory results were obtained when the solution in the tanks was under 35 to 45 pounds of air pressure.

A crew of five helpers and an operator worked at each restraint table (fig. 5). One helper caught a sheep in the catch pen and placed it in a recumbent position at the feet of two men who stood facing each other, by the side of the table. The two men grasped the recumbent sheep by the legs and swung it into the trough upon its back with the head approximating the position of the head rest. Another helper standing on the opposite side of the table, to the left of the operator, held the fore legs of the sheep with one hand and assisted in holding the head with the other. The fifth helper sat on the rear platform of the table and held the hind legs. The operator (fig. 6) forced the nose of the sheep downward between the blocks of the head rest with the heel of the left hand using the thumb and forefinger to hold the nostrils open and operated the nozzle with the right hand. Sheep or goats having horns were satisfactorily restrained for treatment by placing the head over the end of the restraining trough with the neck resting in the notch of the head rest. The horns were braced against the end-support of the stand.

The point of nozzle was inserted one to two inches into first one nostril and then the other in a downward and outward direction so that the stream of solution was directed toward the interior surface of the lateral wall of each nasal passage. During the injection of the solution the animals held their breath and refrained from swallowing, therefore only a moment was required to inject sufficient solution into each nasal passage to cause a return

Fig. 5. Treating equipment in operation. Sheep at left is being discharged from table following treatment. Sheep on right-hand table has just been put into position for treatment.

flow through the opposite nostril. A two-way irrigation of each nasal passage was thus effected. When the treatment was completed the animal was quickly discharged from the tilting trough and another was placed in it for treatment. With sufficient help available to insure the continuous operation of two restraint tables it was possible to treat as many as 700 sheep per hour.

The treatment caused spasmodic sneezing and coughing and a profuse nasal discharge; however, these reactions were of short duration. In some cases a treated animal held its breath until it fell to the ground but such animals usually made uneventful recoveries when immediately helped to their feet. The post-treatment reactions persisted longer among sheep that were held in crowded quarters directly after treatment than among those that were immediately turned out to graze or that were held in spacious corrals.

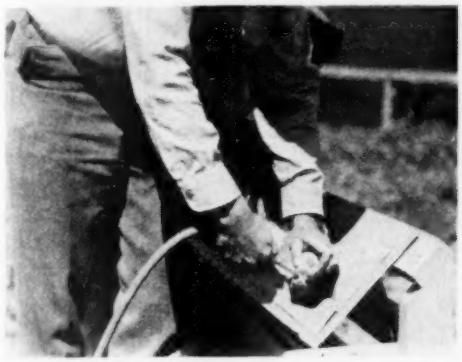

Fig. 6. Operator prepared to inject solution into the nostrils of a sheep. Note that the muzzle is being forced down with the heel of the left hand while the nostrils are held open with the thumb and forefinger.

RESULTS OBTAINED

During the past few years (1936 to 1939) 90,000 New Mexico range sheep in 45 flocks were treated. The treatment was applied principally during the months of November and December. Several sets of the equipment described herein were constructed and used by sheepmen in northeastern New Mexico during 1939. Observation made during the winter and early spring months of the sheep in treated and untreated range flocks, which were grazed under similar conditions, showed no marked difference in the general condition of the animals. However, severe cases of "snotty nose" were not observed among the animals in the treated flocks whereas such cases were often observed among the sheep in untreated flocks. The results of the large-scale treatment of sheep in New Mexico showed that the method of treatment was practicable and was satisfactory to the sheep owners. The owners of treated flocks report that symptoms and death losses among their sheep, commonly attributed to head-grub infestation, are negligible as a result of the annual treatment of their animals.

SUMMARY

1) The existence of *Oestrus ovis* from year to year, in areas where the winters are cold, is dependent upon the survival of minute larvae of the parasite which winter over on the nasal mucosa of infested animals. The destruction of these small grubs in their winter habitat results in the control of the parasite.

2) A 3 per cent solution of saponified cresol, properly injected into the nasal passages during the late fall and winter months, eliminated 90 to 98 per cent of the existing larval infestation from the heads of sheep.

3) The irrigation of the nasal passages of sheep with a 3 per cent solution of the saponified cresol caused sneezing and coughing and a profuse nasal discharge. The reactions were temporary, however, and usually no injury resulted from the treatment when it was administered quickly and the animals were released promptly.

4) Using the equipment described herein, as many as 700 sheep were satisfactorily treated per hour.

5) Approximately 90,000 New Mexico range sheep in 45 flocks have been treated for head-grub infestation. The method of treatment was practicable and was satisfactory to the sheep owners.

Brucellosis in Horses. A Study of Five Cases Without Clinical Symptoms*

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FITCH AND DODGE[1] have recently (1939) shown that the percentage of reactors in cattle is higher on farms where there are infected horses as compared to farms where the horses are free of brucellosis. They also reported an outbreak of brucellosis in a dairy herd following the purchase of two infected horses which were allowed to cohabitate with the cows. None of the horses concerned in their study showed evidence of suppurative bursites (fistula of withers and poll evil) which are not infrequently associated with brucellosis in these animals.

In order to further elucidate the rôle played by infected horses in transmitting the disease to cattle, a number of animals with high agglutination titers but with no clinical signs of the disease are being studied to determine if they are eliminating the microörganism in their excretions. Some of these horses were destroyed and efforts were made to find the site of infection in each animal.

Studies have been completed on five horses, and the results are recorded here as a preliminary report.

METHODS

Only horses with an agglutinin titer of 1-500 or above and which showed no clinical evidence of disease were used in the study. An effort was made to obtain information concerning the presence of brucellosis among the cattle and other horses on the farm.

The infected horses were stabled separately and had no contact with other animals. They were fed grain and hay, and each animal gained in weight during the period of observation. Daily temperatures were recorded for each animal. Weekly blood counts were made, and blood culture studies were made twice a week by drawing 10 to 20 cc. of blood into sterile sodium citrate or liquoide (Hoffman-La Roche) solution and culturing on serum agar slants. Blood was also inoculated into guinea pigs. Agglutinin titers were determined biweekly. Urine specimens were obtained from the mares with a sterile catheter and from the males by vigorous compression and massage of the bladder *via* the rectum. About 250 to 500 cc. of urine was collected twice a week from each animal. Each specimen was centrifuged at 2000 r.p.m. for ninety minutes, and the sediment was inoculated subcutaneously and intraperitoneally into two guinea pigs.

Specimens of feces were obtained biweekly from each animal by manual removal from the rectum. The fecal specimens were prepared for guinea pig inoculation by mixing 100 Gm. of feces with 500 cc. of sterile physiologic sodium chloride solution. After standing in the refrigerator for thirty minutes the material was filtered through sterile gauze and then centrifuged for ninety minutes at 2000 r.p.m. Two guinea pigs were injected subcutaneously with 0.5 cc. of the sediment, and two others received 0.25 cc. intraperitoneally.

Each horse was destroyed and examined after several months of study. A complete necropsy was performed, and tissues were selected for culture and guinea pig inoculation and also for histopathologic study. All guinea pigs were examined four weeks after inoculation by agglutination tests and by culturing the spleens.

Determinations were made of blood sugar, hemoglobin, non-protein-nitrogen,

*Paper No. 1833, scientific journal series, Minnesota Agricultural Experiment Station; these studies were in part made possible by a grant from the Bureau of Animal Industry, U. S. Department of Agriculture.

[1]Fitch, C. P., and Dodge, R. E.: Horses as possible means of spread of Bang's disease among cattle. Cornell Vet., xxix (Jan. 1939), pp. 29-31.

blood urea nitrogen, uric acid, creatine, creatinine, and serum proteins. The results obtained did not differ significantly from normal values. These blood chemistry studies are being continued and will be submitted for publication later.

RESULTS

The guinea pigs inoculated with fecal material experienced a high mortality in spite of the small doses used. Only 45 per cent that were inoculated intraperitoneally survived to be destroyed in four weeks. Of those that received the material subcutaneously 60 per cent survived. Very few guinea pigs inoculated with urine sediment died before the end of three weeks.

Horse No. 1.—A two-year-old stallion with a titer of 1-1000 when received. Nothing definite is known of the other horses on the farm from which this animal came, but it is known that the cattle were tested sixteen times in two years. Reactors or suspects were found on all but the sixth, ninth, and twelfth tests. The agglutinin titer of this animal fell from 1-1000 to 1-250 during the period of nine months of observation. The daily temperatures showed no variation except for a period when there was a sharp rise to 105.8 degrees F. This period lasted for a week, during which time temperatures of 102 degrees to 106 degrees F. were recorded. The animal ate sparingly and was dull and listless. This was the only time that the horse appeared in ill health. He rapidly regained his usual good spirits and remained well until destroyed. Blood counts made twice weekly showed an average red cell count of 6,000,000 and white cell count of 5,000 to 8,000 except at the time of the fever reaction, when there was a drop of 2,500 in white blood cells. During this time there was a marked shift to the left in the differential count. The white blood cell picture gradually returned to normal with the fall in temperature. The blood was cultured four times a week for the first four months and twice a week for the last five months for a total of 119 times with negative results. The urine was examined 73 times by the method outlined above without demonstrating *Brucella abortus*.

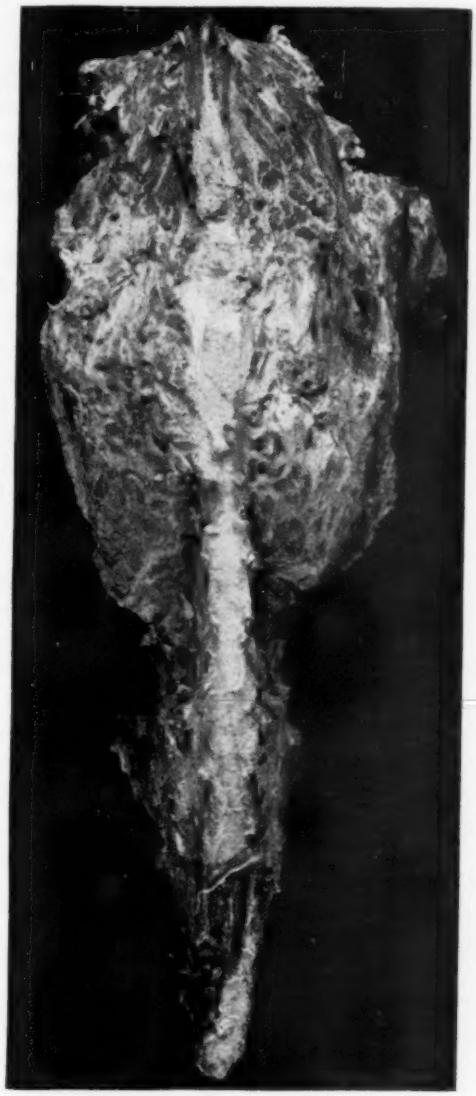

Fig. 1. Portion of the sternum of horse No. 3, showing the marked enlargement at the junction of the second, third and fourth ribs. This contained abscesses from which Brucella abortus was isolated.

Examination of the feces was done 73 times by guinea pig inoculation. *Br. abortus* of the bovine type was recovered from one guinea pig which had a titer of 1-250 in four weeks. On two other occasions guinea pigs inoculated with feces from horse No. 1 have shown an agglutination reaction against *Br. abortus* antigen, but *Br. abortus* could not be isolated from their

spleens by direct culture or guinea pig inoculation.

The horse was castrated after five months of observation. Bacteriologic examination of the testes and epididymes were negative. Histologic studies of these tissues showed no apparent pathologic change.

The animal was destroyed in eight months and a complete examination was made. The thoracic viscera were grossly normal. Except for some adhesions of the omentum to the stomach and adhesions between the hepatic lobes there were no gross changes in the abdomen. All the visible lymph nodes of the alimentary tract from the pharyngeal group, including the tonsils, the cervical, mediastinal, gastrohepatic, mesenteric, and internal iliac lymph nodes were examined by culture and guinea pig inoculation with negative results. Portions of spleen, liver, bone marrow, kidneys, and synovial fluid from tendon sheaths and joints were also examined for the presence of *Br. abortus* with negative results. Histopathologic studies failed to reveal any significant changes that might be related to brucellosis.

Horse No. 2.—A two-year-old mare that had an agglutinin titer of 1-1000 when received. Two of the other four horses on the farm showed lower reactions. The herd of cattle had been tested six times in the previous year, and only on the fifth test were all the cattle negative. During the twelve months of observation on this animal the agglutinin titer remained high. On several occasions a reaction of 1-5000 was recorded. The daily temperature chart and the record of weekly blood counts showed no abnormal changes.

Approximately five months after the purchase of this animal there developed a soft, fluctuating enlargement about 12 cm. long and extending about 10 cm. down from the top of the withers on the right side. *Br. abortus* was isolated by culture from 2 cc. of purulent exudate aspirated from the lesion. This process gradually receded and disappeared entirely after a period of four weeks. Blood specimens were taken 151 times, but *Br. abortus* could not be recovered. Urine and feces were examined 111 times with negative results.

A complete necropsy was performed after twelve months of observation, but no lesions were demonstrable. A careful dissection of the tissues of the withers failed to disclose any purulent exudate such as had been previously found and from which we recovered *Br. abortus*. A few small calcified areas were seen in the ligamentum nuchae. Portions of this and adjacent tissue were used to inoculate guinea pigs. Portions of mesenteric, mediastinal, and bronchial lymph nodes, spleen, liver, bile, peritoneal fluid, ovaries, and synovial fluid from joints and tendon sheaths were also inoculated into guinea pigs, but *Br. abortus* could not be recovered. Histopathologic studies of the tissues revealed nothing significant.

Horse No. 3.—A sixteen-year-old gelding with an agglutinin titer of 1-1000. Of the twenty cows on the farm ten were positive and three were suspects. One horse had a titer of 1-25. During the period of observation, which covered seven months, the titer gradually dropped to 1-250. Daily temperature records showed no marked variation. Blood examinations showed no significant changes during the course of the study. After a period of five months the horse attempted to jump out of the stocks and injured the medial aspect of the left foreleg near the body. This superficial wound healed without causing the horse any apparent discomfort. Urine, feces, and blood were examined 92 times for the presence of *Br. abortus* with negative results.

The animal was destroyed after being studied for seven months. The tonsils and the lymph nodes from the alimentary tract were selected for culture and guinea pig inoculation. The spleen, liver, bile, kidneys, bronchial nodes, marrow from long bones, and synovial fluid from tendon sheaths and joints were also used for culture and guinea pig inoculation.

On removal of the heart and lungs it was found that the pericardium was adherent to the ventral wall of the thorax at approximately the junction of the third or fourth

ribs with the sternum. An abscess containing 10 cc. of purulent exudate was found in this region. Another well-encapsulated abscess about 5 cm. in diameter was found beneath the parietal pleura at the junction of the third ribs and sternum. The process was found to extend down into the sternum. Examination of the sternum showed a marked enlargement at the junction of the second, third, and fourth ribs (fig. 1). Many small abscesses which apparently communicated with the abscess in the thorax were found. The bone was soft and spongy. The purulent exudate from the sternum and thoracic abscess was cultured and inoculated into sixteen guinea pigs. *Br. abortus* of the bovine type was cultured from the spleen of one of the guinea pigs four weeks after inoculation.

Osteomyelitis of the sternum may have resulted from the injury incurred at the time the horse fell on the stocks. It is not known how long the horse had brucellosis. Microscopic examination of the sternal lesion showed an acute suppurative osteomyelitis. No significant changes were found in other tissues.

Horse No. 4.—This horse was a sixteen-year-old mare with a titer of 1-1000. The cattle on the farm had passed two tests for brucellosis, but on a third test one of the eleven cows had a titer of 1-25. Of six horses two had a titer of 1-1000 and one had a titer of 1-50. During the period of observation, which lasted almost four months, the titer of horse No. 4 varied from 1-500 to 1-1000. Blood cultures were made 42 times with negative results. Daily temperature records showed no significant variations. Blood counts were normal. The urine and feces were examined by guinea pig inoculation 32 times. *Br. abortus* was isolated from feces once. Synovial fluid from the right carpal joint was aspirated twice because of the periodic painless enlargement of that joint. Cultures and guinea pig inoculations of this material were negative.

The animal was destroyed in four months. No gross findings of significance were detected. Lymph nodes from the alimentary tract, spleen, liver, kidney, ovaries, uterine mucosa, synovial fluid from sheaths and joints were cultured and inoculated into guinea pigs, but *Br. abortus* was not recovered. Histopathologic studies were not made.

Horse No. 5.—This horse was a five-year-old gelding with a titer of 1-1000. Five other horses on the farm were negative. The herd of cattle had been tested sixteen times in four years, but only on the first, third, seventh, and fifteenth tests were there no reactors. The titer of this horse remained consistently high all during the eight months of observation. The records show that on a number of occasions it was 1-2000 and 1-2500. There has been no clinical evidence of any disease during the entire time of study. The daily temperature chart shows no variation, and the blood counts were within normal limits. Blood cultures were made a total of 98 times and were negative in each instance.

Fig. 2. The chondral end of the ninth rib on the left side of horse No. 5, showing a medullary abscess from which Brucella abortus was isolated. The ninth rib on the right side and the seventh rib on the left had similar lesions.

Feces and urine were examined for the presence of *Br. abortus* by culture and guinea pig inoculation 65 times with negative results.

The animal was destroyed after a period of eight months' observation, and a complete necropsy was made. No gross abnormalities of the thoracic or abdominal viscera were evident. The tonsils and lymph nodes from the alimentary tract, the bronchial nodes, and the spleen, liver, bile, salivary glands, kidneys, marrow from long bones, and synovial fluid from tendon sheaths and joints were cultured and inoculated into guinea pigs, but *Br. abortus* was not recovered. Upon examining the bones for any evidence of osteomyelitis such as was found in horse No. 3 there was found an enlargement of the chondral ends of the ninth rib on both sides and the seventh rib on the right side. The sternum was apparently not involved. It was found that each of these three ribs contained an abscess about 3 cm. in diameter filled with suppurative exudate similar to that seen in the sternum of horse No. 3. The focal suppurative osteomyelitis in each rib seemed well confined, and no tracts or fistulae could be demonstrated (fig. 2). The reaction of the adjacent bone was slight and did not extend more than 1 cm. beyond the limits of the abscess. The purulent exudate was cultured and injected into guinea pigs. *Br. abortus* was recovered from three of the 23 guinea pigs inoculated with this material. Microscopic examination of the lesions in the ribs showed an encapsulated area of necrosis with little involvement of the surrounding marrow.

SUMMARY AND CONCLUSIONS

Five horses that reacted to the agglutination test for *Brucella abortus* infection have been studied by bacteriologic examination of blood, urine, and feces. Complete necropsies were made on each animal and various tissues were examined for the presence of *Br. abortus*.

Br. abortus was isolated from the feces of two. Another horse developed an abscess of the withers from which *Br. abortus* was isolated. The microörganism was isolated from a lesion in the sternum of a fourth horse and from lesions in the ribs of a fifth. The microörganism could not be demonstrated in the blood stream or urine of any of the horses.

The observation that *Br. abortus* may be eliminated with the feces in infected horses leads to the conclusion that such animals may be a source of infection for cattle.

American Typhus Vaccine Under Critical Test

The United States Public Health Service has received word from Hungary that the American type of typhus vaccine taken to Budapest last spring by Dr. Eichhorn of the federal bureau of animal industry has been used on two "guinea pig" communities. It will be recalled that this vaccine affords complete protection in test-tube experiments, but as the dispatch says, there is no final test of a typhus vaccine except an epidemic.

The importance of typhus vaccination now lies in the fact that 10 million persons died of that disease following the armistice of 1918. Inasmuch as wide publicity was given to the production details in American journals of science, the other European countries can all follow the pattern. The objective is to stop typhus regardless of race, creed or nationality.

Clinical Studies

An important influence [in medicine] is undoubtedly the increase in the number of non-medical investigators: doctors of philosophy in the basic sciences who are primarily responsible for teaching in the premedical branches. Indeed, there are many institutions in which the teachers concerned with the study of the effect of drugs in health and in disease are doctors of philosophy and pharmacology who have in their own training been without any considerable contact with any cases of disease.—*Excerpt from an editorial in The Journal of the American Medical Association.*

Preliminary Observations on the Duration of Immunity in Cattle Vaccinated in Calfhood with Strain 19 of Brucella Abortus*

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THE WORK of Cotton, Buck and Smith[1] established strain 19 as a strain of Brucella organisms possessing a suitable degree of virulence for calfhood vaccination, as a means of preventing bovine brucellosis (Bang's disease). The results of this and later work indicate that considerable resistance is generated in cattle by that vaccination. It has been emphasized by many investigators and control officials that there is a need for more information on the duration of immunity in later pregnancies that could be attributed definitely to the effects of the calfhood vaccination.

This paper summarizes the results of an experiment with 15 heifer calves that was started in the autumn of 1936. Thirteen of these animals, including nine principals and four controls, completed two gestation periods. The calves were all negative to the standard test tube agglutination test. They were vaccinated on November 12, 1936, when from four to six months of age, following the procedure outlined by veterinarians of the United States Bureau of Animal Industry.

Through the courtesy of W. E. Cotton, the writer was furnished with a culture of strain 19 in July, 1935. Proper examinations have indicated that this culture has maintained the characteristics of a normal smooth strain.

The experimental animals were kept on premises free from Brucella-infected animals in order to determine that any immunity beyond the first pregnancy was due to the calfhood vaccination. Bulls used for services showed no reactions to agglutination tests for Brucella infections. With few exceptions, monthly agglutination tests were made on the blood serum of the experimental animals.

DEGREE OF EXPOSURE

The desirability of a more uniform exposure dose to test the immunity of cattle against brucellosis has been indicated by the report of McEwen, Priestly and Paterson.[2] These investigators suggested that a dose of 14.6 million viable organisms placed on the surface of the eye would constitute an exposure sufficiently severe to test the immunity of vaccinated cattle. Moreover, they suggested that even when small numbers of animals were used in an experiment, if the vaccinated animals showed greater resistance than the controls, it would afford evidence of immunity. Cotton, Buck and Smith[1] used conjunctival exposures consisting of three drops of saline suspension of viable *Brucella abortus*. The density of the suspension corresponded to twice that of tube 1 of the McFarland nephelometer. This degree of exposure was considered as approaching more nearly that found in actively infected herds. Haring and Traum[3] found that when mature nonpregnant heifers were vaccinated, the resistance could be overwhelmed if the exposure doses exceeded 1½ billion virulent *Br. abortus* organisms.

Table I shows the period of the second pregnancy when each animal was exposed. A suspension in physiological salt solution was prepared from the second generation of a *Br. abortus* strain isolated from a fetus in a naturally infected herd. The density of the suspension was somewhat less than tube 2 of the McFarland nephelometer. Each principal and control received 0.15 cc. of this suspension on the conjunctiva. An estimate of the bacterial content

*From the Purdue University Agricultural Experiment Station.

[1]Cotton, W. E., Buck, J. M., and Smith, H. E.: Further studies of vaccination during calfhood to prevent Bang's disease. J.A.V.M.A., lxxxv (1934), n.s. 38 (3), pp. 389-397.

[2]McEwen, A. D., Priestly, F. W., and Paterson, J. D.: An estimate of a suitable infective dose of *Brucella abortus* for immunization tests on cattle. J. Comp. Path. & Therap., lii (1939), 2, pp. 116-128.

[3]Haring, C. M., and Traum, J.: Observations of pathogenic and antigenic effects of *Brucella abortus*, United States bureau of animal industry, strain 19. J. Agr. Res., lv (1937), 2, pp. 117-128.

TABLE I—Duration of gestation period and time of exposure for each vaccinated and control animal.

GROUP	COW NO.	FIRST PREGNANCY (DAYS)	EXPOSURE TIME IN SECOND PREGNANCY (DAYS)	SECOND PREGNANCY (DAYS)
Vaccinated	10	286	160	277
	12	277	172	231
	13	280	142	281
	14	287	173	250
	17	279	144	282
	20	286	164	282
	21	281	135	294
	23	278	169	281
	32	276	177	223
Controls	15	272*	180	238
	16	277	130	200
	18	287	181	225
	22	277*	165	232†

*Full-term dead calf.
†Approximate.

was made by means of the Levy hemacytometer with improved Neubauer rulings. This estimate indicated that there were approximately 240 million organisms in the exposing dose for each animal.

RESULTS

The gestation periods of each pregnancy are given in Table I. Table II shows the results of agglutination tests conducted with the blood and milk.

In the first pregnancy, all the experimental animals completed full-term gestation periods, but the calves of control cows 15 and 22 were born dead. Colostrum, or milk during the first month of lactation, was obtained with aseptic precautions from all quarters of the udder. Attempts to demonstrate *Br. abortus* in these samples with liver infusion agar slants were negative. Vaccinated cow 20 was the only animal that showed agglutinins in the milk in the 1-25 dilution at the termination of the first pregnancy.

As indicated in Table II, six weeks after exposures were given in the second pregnancy, three vaccinated animals and three controls showed significant blood-agglutinin titers. Three vaccinated animals, cows 12, 14, and 32, delivered premature living calves. Following parturition, blood tests showed that two of these, cows 12 and 14, and the four controls had developed high agglutinin titers. The six remaining principals did not show high agglutinin titers following exposure and they delivered full-term living calves.

Cultures and guinea pig inoculations gave positive evidence of Brucella infection of the uterus and udder in the three principals that calved prematurely. *Br. abortus* was demonstrated in the colostrum, placenta and calf of cow 12, in the colostrum of cow 14, and in the placenta and calf of cow 32. Examinations of the udder of cow 32 at autopsy showed infection with *Br. abortus*. Guinea pig inoculations were also made of the colostrum, or milk, and placenta of the six principals that delivered full-term living calves. The guinea pigs were killed six to nine weeks after injection and blood agglutination tests and cultures were made. The results were negative.

Uterine and udder infection with *Br. abortus* was demonstrated in control cows 15, 16 and 18. The placenta and fetus of cow 22 were lost in a pasture, and since this animal did not have a milk flow, colostrum milk examinations were not obtained. Examinations of the udder tissue of this animal at autopsy did not show Brucella infection.

DISCUSSION

In this experiment, it seems significant that three of the nine second-pregnancy cows, vaccinated as calves, did not complete full-term gestations and became infected with *Br. abortus*. This indicated that these animals were not protected

against the exposures used in this experiment, even though the calves were born alive. Therefore, it would be misleading to use abortions (dead calves) as the only criterion in interpreting these results.

It seems obvious, in experiments of this nature, that it is necessary to consider the severity of exposure in testing the immunity produced. McEwen[1] reported an experiment with cattle vaccinated with an avirulent strain of *Br. abortus*. Using an exposure of 1460 x 10^4 organisms, determined by viable counts, he recovered infection from two of four vaccinated animals. With a dose of 1460 x 10^6 organisms, he found that four of five vaccinated animals became infected. The degree of resistance demonstrated in the vaccinated animals in this experiment indicated that the amount of exposure was not overwhelming.

SUMMARY

Fifteen heifer calves, negative to the brucellosis-agglutination test, were obtained to study the duration of immunity in their second gestation as a result of vaccination with *Brucella abortus* strain 19. Thirteen of these animals were carried through two gestation periods. Nine were vaccinated when four to six months of age and four were kept as controls.

One month following vaccination the blood agglutinin titers of the vaccinated heifers varied from 1-100 to 1-500. During the first five months the titers dropped to 1-25 and 1-50.

At the end of the first pregnancy the nine principals delivered full-term living calves. The four controls also carried full-term calves but two were born dead.

Following exposures in the fifth and sixth month of the second pregnancy, six principals gave birth to full-term living calves. Two of the other principals delivered living calves in the middle of the eighth month and one early in the ninth month of gestation. *Br. abortus* was demonstrated in the three animals that calved prematurely.

At the termination of the second pregnancy two controls dropped dead calves and

[1]McEwen, A. D.: The demonstration of immunity in cattle vaccinated with a non-virulent strain of *Brucella abortus*. J. Comp. Path. & Therap., lii (1939), 2, pp. 129-131.

TABLE II—Results of agglutination tests with blood and milk of vaccinated and control animals.

Group	Cow No.	Blood Agglutination Tests: Maximum Titers Following Vaccination (34 Days)	Blood Agglutination Tests: Titers Following Exposure: 10 Days	44 Days	Maximum Titers Following 2nd Pregnancy	Milk Agglutination Tests: First Pregnancy: RF	LF	RR	LR	Second Pregnancy: RF	LF	RR	LR
Vaccinated	10	250	25	25	25	——	——	‡25	——	——	——	——	——
	12	100	50	500	2500	——	——	——	——	250	50	100	250
	13	500	50	100	25	——	——	——	——	——	——	——	——
	14	250	100	250	2500	——	——	——	——	5000	5000	5000	2000
	17	250	25	25	25	....	....	....	....	——	——	——	——
	20	500	25	50	25	25	25	25	25	50	‡25	‡25	‡25
	21	500	50	50	25	——	——	——	——	——	——	——	——
	23	250	25	25	25	——	——	——	——	50	——	25	‡25
	32	250	50	500	....	——	——	——	——	2000	1000	10,000	2500
Controls	15	——	‡25	50	2500	——	——	——	——	....	....	....	....
	16	——	25	250	5000	——	——	——	——	250	250	250	100
	18	——	25	500	2500	——	——	——	....	2500	5000	1250	2500
	22	——	‡25	500	2500	——	——	——	——	....	....	....	....

——=Negative in 1-25 dilution.
‡=Incomplete agglutination in 1-25 dilution.
....=Not tested.
Quarters of Udder:
RF=Right front. RR=Right rear.
LF=Left front. LR=Left rear.

The Curative Effect of Stale Bread in Enteritis of Swine

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ENTERITIS is a serious problem to the feeder and veterinarian. It is of more importance than hog cholera inasmuch as hog cholera can be prevented with serum and virus. The sales barn, commonly called community sales, has done much to spread this disease.

A number of organisms are incriminated. Research workers have done a great deal in helping us to handle this condition. Some of them are of the opinion that there is a dietetic as well as a microbian cause to consider. In fact, it is believed that infection may be but a secondary factor. In our practice, we accept this theory, having noticed, locally at least, that the sales barn has attracted many pig traders from far and near, who bring thousands of pigs to our sales barn. In the last seven and eight years they have come from as far as the drouth sections of Oklahoma and Texas.

The history of these pigs reveals that nearly all of them have been raised in dry lots on a scant ration of oats, wheat, some barley, or perhaps some sargo or kafir. It is common to see pigs weighing less than a hundred pounds at the age of six to nine months.

Most states have some kind of sales-barn laws that require that such pigs be vaccinated with either serum or serum and virus.

As most feeders know that serum alone is dangerous, serum and virus is used. This vaccination is bad as such pigs are in no condition to stand serum and virus.

In following up cases so treated, we find that 90 per cent of the herds carry enteritis from a few days to as long as six weeks after vaccination. It is obvious, in that event, the bacteria are present in a badly shrunken and weakened digestive tract at the time of vaccination. Too, a pig coming to the Cornbelt farm in this condition is a poor risk. As most of these pigs are put into the lot to follow steers on full feed of yellow corn and other concentrates, they naturally consume more protein and fats than they are accustomed to. Those not following cattle are fed corn, tankage and alfalfa in liberal amounts. The injured digestive tract can not handle such diet, especially after receiving hog-cholera virus. When the temperature rises from the virus an acidosis develops and in this favorable medium, the ever present flora develops and causes the septicemic condition known as enteritis. We have records of thousands of such pigs.

In handling them we have used serums, bacterins and alkalies of all kinds and the results have been none too good.

THE USE OF STALE BREAD

For the last six months we have been trying out a treatment with more promising results. In dieting growing children, much stress is given vitamins. All authorities agree on this point. They recommend bread at least thirty-six hours old. Stale bread, especially whole wheat bread, is rich in B_1 and B_2. Some writers claim that this vitamin is never lacking in the usual feed of animals. But these pigs have never had a balanced diet.

It has also been our experience that even the home-grown pigs, especially when the market has suffered a decline, suffer from this same sort of malnutrition. We are often consulted by farmers regarding chol-

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(*Continued from preceding page*)

one a live calf in the eighth month of gestation. The fourth control aborted in the seventh month of pregnancy. *Br. abortus* was demonstrated in the colostrum and fetal tissues of three controls, while material for bacteriological examinations was not obtained in the fourth control animal.

era immunization in home-grown herds. Upon seeing and holding autopsies on these pigs the same condition as that in pigs from drouth areas is found. The results following the use of serum and virus in this condition are well known. In these cases, we feed large quantities of stale bread and alkalies in the ration. The results have been uniformly good. After ten days of this treatment it was found safe to use serum and virus. We have also noted a gain in weight following the use of stale bread and alkalies.

Experiments on over thirty groups of pigs suffering from enteritis, most of them from drouth areas, have been carried out on some fifteen hundred head. In this series, a variety of forms of enteritis were found. They all responded well to the bread and alkalized diet. Herewith is a series of reports on these experiments. These experiments were carried out on farms where there were no scales available to check weights. In some cases the owner put our control groups on stale bread and alkalies before the experiments could be completed.

HERD 1

(81 head, 22 sick, temperatures, 104° F. to 105.5° F. Date Dec. 4, 1939)

History: Bought at sales barn ten days previously and given serum and virus.

Symptoms: One pig was killed and autopsied. Some pneumonia, some petechiae in kidneys. Stomach raw and corrugated. Extensive inflammation throughout digestive tract. Some free blood in the cecum. Spleen very much enlarged and studded on the ventral surface.

Treatment: Advised treatment with alkaline solution in suitable diet. It was decided to do a bit of experimenting with them. They were divided into two groups. One group of 11 visibly sick and 30 apparently healthy were placed on 75 per cent pulverized oats and 25 per cent pulverized corn in alkaline solution. The remainder of this herd were put on pulverized oats 40 per cent, shorts 20 per cent, stale bread 40 per cent. This was fed in an alkaline solution.

Results: In group not on bread: 6 deaths, 14 apparently healthy sickened, one died. At the end of eight days owner placed this group on oats, shorts and stale bread. They were kept on this diet for 9 days. All apparently recovered.

Results in group on bread: 1 death, none of the healthy sickened, all visibly sick apparently recovered in 10 days of this treatment.

HERD 2

(14 head, 12 sick, temperatures, 103.2° F. to 106.0° F. Date Dec. 19, 1939)

History: Bought from a dealer who bought them from a sales barn eight days previously. At that time these pigs had been given serum and virus.

Symptoms: Gaunt with staggering gait. Profuse greenish mucus-covered diarrhea. The bowel evacuations had sickening sweetish odor. These pigs had a ravenous appetite. They tried to eat boards off the fences and chewed on the frozen ground.

Postmortem Lesions: One pig was killed and autopsied. Some pneumonia, entire digestive tract was raw and somewhat corrugated. For shoats weighing 104 pounds, the stomach and intestines were small and shrunken. It is evident that these shoats came from some drouth stricken country.

Treatment: Entire group was placed on 60 per cent pulverized oats, 40 per cent stale whole wheat bread and alkaline solution. This bread was somewhat greenish with mould. It was probably over ten days old. These shoats ate ravenously of this diet and almost immediate improvement was noted. The treatment was continued for ten days. At this time the alkaline solution was discontinued and equal parts of oats, corn and stale bread were fed for two weeks longer. These shoats did remarkably well after being put on a full feed of corn, alfalfa and tankage.

HERD 3

(44 head, 20 sick, temperatures 103.5° F. to 105.2° F. Date Dec. 28, 1939)

History: An Oklahoma dealer brought this herd to a northern Kansas sales barn

where it was given serum and virus and mixed infection bacterin eleven days previously.

Symptoms: Gaunt, with a short hacking cough. They had a depraved appetite and ate ravenously of oats (which was passing through them only slightly digested) and alfalfa. These pigs wobbled and staggered as they walked. They would chew on troughs and eat cobs but would not drink a thin milk slop. These pigs weighed 71 pounds and had plenty age. It was very evident that they were from the drouth area.

Postmortem Lesions: None was examined.

Treatment: .10 visibly sick and 12 apparently healthy were placed in each of two lots. Lot No. 1 was given 50 per cent pulverized oats and 50 per cent pulverized yellow corn. This was fed with an alkaline solution. Lot No. 2 was fed 40 per cent pulverized oats, 20 per cent pulverized yellow corn and 40 per cent stale bread and alkaline solution.

Results: Lot No. 1: 2 of the visibly sick died and five apparently healthy sickened in six days. Without consulting me the owner placed Lot No. 1 on the same diet as those in Lot No. 2. This was continued for ten days. One more died and one sickened but recovered. Loss of weight in this group was very noticeable.

Results: Lot No. 2: All of the sick recovered in 12 days and none of the apparently well sickened.

Conclusion: The vitamin in stale bread seemed to be the factor lacking in the diet of these particular pigs. After feeding for 40 hours the pigs in each group stopped chewing on troughs, etc. Bread is also a wonderful vehicle for conveying medicine to the inflamed stomach and intestines.

HERD 4

(60 head, 60 sick, temperatures 104.4° F. to 106.2° F. Date Jan. 1, 1940)

History: Bought from dealer six days previously, who told the farmer that this herd had come from southern Kansas the week before. A vaccination certificate showed that these pigs had been bought at a sales barn and vaccinated with serum and virus at that time. They weighed 104 pounds average and looked to be at least a year old. Outward appearances suggested that these shoats had never been on anything but an unbalanced starvation diet.

Symptoms: All showed watery diarrhea. Most of this group had an impaired appetite but seemed to crave salt. These hogs would not take a sloppy milk diet containing ground oats and corn but would greedily eat refuse from table and kitchen. Skin was rough, covered by a scant growth of long hair.

Treatment: Believing this case was due to unbalanced ration they were put on 50 per cent pulverized oats, 30 per cent alfalfa and 20 per cent yellow corn, with considerable bone meal. They were kept on this diet for four days. The entire lot became steadily worse and two died.

Postmortem Findings: A small shrunken stomach and intestine. Entire intestinal mucosa was swollen and highly inflamed with some necrotic spots in the colon.

Treatment: They were divided into two groups and treated with alkalies in different diets.

Group No. 1: 40 per cent stale bread, 40 per cent pulverized oats, 10 per cent yellow corn, 10 per cent fourth cutting alfalfa with alkaline solution.

Group No. 2: Fed 60 per cent ground oats, 30 per cent ground corn (yellow), 10 per cent pulverized alfalfa in alkaline solution.

Results: Group No. 1: All apparently recovered in ten days but were kept on this diet for five days longer. Alkalies were discontinued on the tenth day.

Group No. 2: Two died on the eighth day but diarrhea had checked partially. Balance of this group was put on same diet as Group 1 for ten days. No more sickened or died; apparent recovery.

HERD 5

(104 head, 36 sick, temperatures 104.8° F. to 105.6° F. Date Jan. 27, 1940)

History: Bought the week before at a sales barn and vaccinated with serum and

virus. A dealer had brought these hogs from western Kansas and southwestern Nebraska. They averaged 76 pounds on the day of the sale. They were fed yellow corn, milk slop and alfalfa hay. Three died and were autopsied. These shoats had plenty of age.

Postmortem Findings: These autopsies showed typical suipestifer infection.

Treatment: The following schedule was carried out:

Group No. 1: 12 apparently sick and 25 apparently healthy were put on 40 per cent stale bread, 50 per cent pulverized oats, 10 per cent pulverized yellow corn with alkaline solution.

Group No. 2: 12 sick and 20 apparently healthy were put on 60 per cent oats, 30 per cent pulverized yellow corn and 10 per cent ground alfalfa with alkaline solution.

Group No. 3: 12 sick and 20 apparently healthy were put on 40 per cent stale bread, 40 per cent pulverized oats and 10 per cent yellow corn, 10 per cent alfalfa. No alkaline given.

Results: The following results were obtained in the three groups:

Group No. 1: All recovered and none sickened in ten days. They were kept on bread diet for seven more days and then put on full feed of corn, tankage and alfalfa with no further trouble.

Group No. 2: 2 sick pigs died and 4 apparently healthy sickened in six days. This group was then put on same diet as group No. 1. One more died but no more sickened in fourteen days and they were then placed on full feed.

Group No. 3: One pig died in ten days, but no more sickened. They apparently gained weight but the visible sick were still scouring. The eleven remaining sick were placed on the same diet as Group No. 1. In eight days the scouring had stopped and the pigs were kept on this diet for another week and then put on full feed.

Conclusion: We are aware of the limitations of this experiment. It must, however, be admitted that bread had food value and was the best vehicle for conveying the alkalies where needed. Alkalies seem indispensable in these cases.

HERD 6

(104 head, none sick, temperatures 101.4° F. to 102.2° F. Date Jan. 29, 1940)

History: Bought at a local sale January 29th. These shoats came from a drouth stricken area in west central Nebraska, with a history of having only a ration of sargo grain and some alfalfa. These shoats had good bone and fair frame, supposed to have been farrowed in May, 1939, and averaged 59 pounds. It was decided to vaccinate, 52 with serum alone and 52 with serum and virus. Both herds were fed pulverized oats 60 per cent, 20 per cent yellow corn and 20 per cent pulverized alfalfa with alkaline solution.

Serum and Virus Group: Five days after vaccination, 3 of this group were off feed with temperatures of 104.8° F., 104.8° F. and 105.4° F., thumping and some mucus in extremely loose stools. These were given more hog-cholera serum. Two days later these 3 were dead and 16 more similarly affected. We killed and autopsied 3 of the sick ones and found the usually raw, corrugated intestines and greatly enlarged spleen.

Treatment: The diet was changed to 60 per cent pulverized oats, 40 per cent stale bread with alkaline solution.

Results: After 12 days of this diet 6 of the affected died and 2 more sickened but recovered. These pigs never grew, and fattened very slowly. They were marketed at 180 pounds.

Serum-Alone Group: Only one in this group sickened and none died. This group did much better than the serum and virus group and were marketed at 220 pounds. At the same time the other group was marketed at 180 pounds, and the serum-alone group were successfully given serum and virus, March 15, 1940.

Conclusion: From this experiment we believe that it is not advisable to give these drouth pigs serum and virus and that stale bread is of great value in the diet of those given serum and virus.

The above is a series of six experiments. We have 24 more experiments almost identical. We conclude that bread (stale) has merit both as a pulpy, easily digested food, a soothing mass to a raw, aching intestine and is also a good vehicle for carrying the necessary alkaline solutions to them. Also, it is not advisable to administer serum and virus to these sale barn pigs. Revaccinating with serum and virus after 45 to 60 days is preferable.

Adrenal Cortex Exhaustion and Its Relationship to Dehydration

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THE ADRENAL CORTEX and adrenal medulla are really separate glands. In mammals, the adrenals are compound glands formed by the union of two separate types of tissue. In some of the lower forms of animal life, such as the elasmobranch fishes, the cortex tissue is anatomically distinct. It forms separate glands called "interrenal glands," because they lie between the kidneys. A similar condition exists in mammals during early embryonic development, but the interrenal glands and the medullary glands unite to form a single structure before birth. Thus a cross-section of a mammalian gland shows a central light-colored portion, called the medulla, and an outer darker-colored shell, called the adrenal cortex.

The adrenal medulla is really a part of the sympathetic nervous system and is ectodermal in origin. The adrenal cortex is mesodermal in origin and constitutes a distinctly separate tissue.

EPINEPHRINE

Epinephrine is the hormone of the adrenal medulla. The pressor effects of extracts of the medulla were observed by Oliver and Schaefer in 1894. These observations were followed ten years later by the isolation and identification of the active principle, epinephrine. The actions and uses of epinephrine are familiar. The uses are based upon its stimulating action on the sympathetic system. It causes vasoconstriction, cardiac acceleration, and increase in blood pressure.

ADRENAL CORTEX HORMONE

The adrenal cortex hormone is entirely distinct from epinephrine and should never be confused with it. It is essential for life, but an animal or human being can get along without the adrenal medulla and epinephrine.

Physiologic Functions of the Adrenal Cortex.—It is important to understand the principal physiologic functions of the adrenal cortex, since these constitute the basis of all adrenal cortex therapy. The adrenal cortex hormone is essential for all higher life. It is interesting to study the manner in which the adrenal cortex exerts its fundamental control over vital processes.

The present view, that the adrenal cortex is concerned with the maintenance of normal salt and water balance, developed from the observations of Stewart and Rogoff (1925) that the lives of adrenalectomized animals could be prolonged by injections of salt solution. This work was later confirmed by Banting and Gairns (1926), Marine and Baumann, and Baumann and Kurland (1927). Lucas (1926) demonstrated that the blood of adrenalectomized animals showed increase in viscosity, decrease in plasma chloride, and increases in non-protein nitrogen and urea. Rogoff and Stewart (1926) reported similar findings, and in addition to decreased sodium and chloride in the blood plasma of adrenalectomized cats Baumann and his associates demonstrated significant increases in potassium of the blood plasma. There followed many studies on the blood chemistry of adrenalectomized animals. Clinical applications of these laboratory findings were made by Rogers (1931) who described the beneficial clinical effects of combining intravenous administration of salt solution with adrenal cortex extract. Loeb (1932-1933) later elaborated on the value of salt administration and its connection with the electrolyte pattern in Addison's disease.

In Addison's disease, as in adrenalectomized dogs, Loeb and his associates (1933-1935) demonstrated an increased excretion of sodium and chloride by the kidneys. The blood showed a fall in the level of sodium and chloride and increases in urea

and potassium. Administration parenterally of potent adrenal cortex extract restored the electrolyte balance. The administration of sodium and chloride by mouth apparently decreased the maintenance dosage of the adrenal cortical hormone.

The continued loss of sodium accompanied by loss of water in adrenal insufficiency leads to dehydration characterized by hemoconcentration, reduced blood volume, and reduction of blood pressure. That the hemoconcentration may occur by mechanisms other than those involved in the loss of salt and water in the urine was demonstrated by Darrow and Yannet (1935). These investigators showed that in normal animals rapid withdrawal of water from the blood to the tissues followed the depletion of plasma sodium and chloride by intraperitoneal injections of isotonic glucose followed by paracentesis. The concurrent shock-like symptoms could be relieved by parenteral administration of adrenal cortex extract. A shift of water from the tissue to the blood took place, but the plasma sodium and chloride remained low.

Adrenal cortex extract has been demonstrated to bring about electrolyte balance in conditions other than adrenal insufficiency where similar changes in the electrolyte and water balance occur. In dehydration resulting from certain nutritional disturbances, MacLean and associates (1932) found adrenal cortex to be effective in causing carbon dioxide capacity, chlorides, sugar, and non-protein nitrogen of the blood to return to normal levels.

Acute intestinal obstruction, Wohl, Burns, and Pfeiffer (1937) observed, is a representative of the group of conditions characterized by high blood nitrogen and low blood chlorides that bear close resemblance to adrenal insufficiency. Their observation is upheld by their earlier findings of the degenerative changes occurring in the adrenal cortex in dogs with high intestinal obstruction (1937) and their demonstration of the effectiveness of the combined administration of physiologic salt solution and cortical extract in combating the toxemia and increasing the survival period of dogs with high intestinal obstruction. The similarity between the clinical and experimental pictures of acute intestinal obstruction and adrenal insufficiency is strengthened further by the demonstration of Scudder, Zwemer, and Truszkowski (1937) that high levels of serum potassium in cats occur with anterior intestinal obstruction.

In adrenal cortex deficiency, the circulating plasma volume is reduced. Several factors contribute to this hemoconcentration or blood dehydration. There is an excessive water loss through the kidneys. At the same time, the extracellular water of the tissues becomes depleted. Swingle has suggested that increased capillary permeability is partly responsible for loss of circulating plasma volume (1923). The tissue cells themselves may hold plenty of water—even too much as is demonstrated by the highly toxic effect of injected distilled water—but this water is imprisoned within the cells and not available for restoration of plasma volume. As a result of hemoconcentration and low plasma volume, the blood pressure is lowered, and peripheral circulatory failure follows unless the cortical deficiency is counteracted.

Mechanism of peripheral circulatory failure.—In 1923 Ebbecke (1929) showed that capillaries possess tonus and may become constricted or dilated by processes that are independent of the arterioles and venules between which they are located. He showed further that inflammatory reactions to drugs, bacterial toxins, anesthetics, foreign protein, burns, and mechanical and electrical stimulation were produced not by the nerve stimulation set up by the irritant but by the substances released locally by tissue cells. These substances affect the neighboring capillaries, causing loss of tonus, dilation, slowing of the blood flow, stasis, increased permeability to blood plasma, and edema. Further proof of the release of these substances from the tissue cells was offered later by Krogh (1929) and Lewis (1937). The latter believed that one substance was responsible, and because of its physiological resemblance to histamine it was named H-substance. Much work that tended to indicate that this single substance alone was entirely responsible for eliciting the capillary response followed,

but more recent work showed that a number of substances normally present inside the tissue cells passed through the cell walls into the extracellular fluids where they come in contact with the capillaries. Although this histamine-like substance is released, it is probably less active than the other substances in producing inflammatory changes. Menkin (1936) showed that the release of certain inorganic ions from the cells, notably potassium, plays a rôle in increasing capillary permeability at the site of inflammation.

Injury to the capillaries by any condition or agent produces changes in tonus and permeability of capillaries, in the rate of blood flow and, if extensive enough, in deranged balance of body fluids. Plasma escapes into the surrounding tissue spaces and thus expands the interstitial fluid compartment. With the loss of plasma the blood cells become concentrated in the dilated capillaries and venules, materially interfering with the blood flow. If the process involves a large area, the loss of blood fluid and the packing of blood cells will be reflected in a high blood viscosity and specific gravity and an increase in the red blood cell count. To compensate for the decreased blood flow the arterioles become constricted.

Administration of epinephrine at this point may temporarily improve the circulation by increasing the blood pressure but only at the expense of the peripheral circulation (1936). With the continued loss of plasma volume through the permeable capillaries, a fall in blood pressure occurs and a state of shock is present. Where loss of fluid is caused by hemorrhage a similar train of events occurs. However, the red blood cell count and blood protein will be lower.

Cycle of events perpetuating the loss of blood fluid.—The loss of capillary tone, stasis, poor return flow of blood, and the continued loss of fluid through the permeable capillaries result in an inadequate supply of oxygen to the tissue cells. The tissue asphyxia further increases the permeability of the capillaries and the condition becomes aggravated.

Thus, in adrenal cortex deficiency the animal is in a very unstable state where even a small hemorrhage or a slight trauma will produce serious or fatal shock. Any emergency which requires fluid shift is poorly met in cortical deficiency. In such a condition the administration of a potent adrenal cortex extract brings about a readjustment in the electrolyte and fluid distribution and the entire picture is returned to normal.

An abundance of the adrenal cortical hormone is essential for maintaining a normal electrolyte pattern and proper fluid balance between the various compartments, and keeps the tissues in a state of normal permeability so that any disturbance of blood volume and circulation can be promptly compensated by a quick shift of fluid from the tissues to the blood stream. In other words, an abundance of cortical hormone probably constitutes protection against the chief hazards of surgical operation, namely, anesthesia (1937-1938), hemorrhage (1937), and shock (1937).

Effect of injectable adrenal cortex extract in the normal animal.—The adrenal cortex hormone increases the urinary excretion of potassium and nitrogen and decreases the excretion of sodium not only in adrenal insufficiency and other conditions where similar imbalance of electrolytes exists but also in the normal animal. Harrop and Thorn (1937) showed that injections of cortical extract given twice daily increased the excretion of potassium, inorganic phosphate, and nitrogen in normal intact dogs and decreased the excretion of sodium and chloride. No harmful effects of large doses of natural adrenal cortex hormone have been observed.

Striking similarities exist between the disturbances of water and salt balance of adrenal insufficiency and dehydration produced by a number of agents or conditions. The use of a potent adrenal cortex extract as a therapeutic agent when dehydration is present or as a form of preventive treatment where dehydration is threatened is now becoming widely accepted in veterinary medicine on the scientific grounds already established. The evidence of the necessity

for the presence of adrenal cortex hormone to maintain normal capillary and tissue permeability, for maintaining circulation, and to prevent fatal exhaustion that occurs in severe dehydration is continuously receiving support. Adrenal cortex extract has been found to be of value as supportive treatment in gastroenteritis, canine distemper, pneumonia, infectious enteritis of cats, and in other debilitating diseases where dehydration may occur.

ADMINISTRATION AND DOSAGE

In acute crises the intravenous administration of large doses, 2 to 4 cc., is indicated. The administration of fluids and sodium salts plus the cortical extract has been found to be most efficacious treatment. In other conditions of severe stress, such as toxemias and infections, where isotonic salt solutions are commonly administered by hypodermoclysis or venoclysis the addition of adrenal cortex extract in 1 to 3 cc. doses to the infusion fluid may prove of benefit. An increasing number of reports show that the cortical hormone is intimately concerned in the maintenance of salt and water balance. In partial adrenal insufficiency, where asthenia is the outstanding symptom, and in other conditions where hyposecretion of the adrenal cortex may exist, the usual mode of administration should be ½ to 2 cc. subcutaneously or intramuscularly daily or on alternate days. From the present knowledge concerning adrenal cortex extract therapy, it appears preferable to use the larger doses since overdosing is not probable.

Oleo an American Farm Product

For the month of July 1940, 22,812,000 lb. of oleo were manufactured in the United States. Into that month's output went 13,995,000 lb. of domestic vegetable oils and 1,819,000 lb. of animal fats. The foreign vegetable oils used amounted to but 1,856,000 lb. The vegetable oils were cottonseed, soybean, and peanut, all products of American farming.

Commenting upon this agrarian thorn, *The Prairie Farmer* says: "By using such a high percentage of domestic vegetable and animal oils, and so small a percentage of foreign vegetable oils, the oleo manufacturers have lessened the force of the dairyman's old argument against the foreign coconut cow."

Black Death

During the 14th century (1347 to 1350), 25 million persons out of a total population of 105 million in Europe died of bubonic plague, called black death. The disease, according to one chronicle, started in China about 15 years before and gradually swept westward into Europe. Wars, revolutions and famine had overtaken the world, and in the absence of any knowledge of its epidemiology, it raged unchecked. In some regions the mortality was 100 per cent. Everybody died. In England nine tenths of the population perished (Hecker). Social order broke down completely throughout Europe. Thousands of dead remained unburied, deserted by fleeing populations. It was the popular belief that the end of the world had come.

The importance of this greatest of all epidemics is that it was neither the start nor the end of bubonic plague. Hippocrates wrote of buboes, and mention of its occurrence is made by medical writers throughout the early centuries of our era. It arrived in San Francisco in 1900, in New Orleans in 1914, and in Texas and Florida in 1920. In 1937, there were three cases in California, one in Nevada and one in Utah. The last case (in our records) occurred in Utah in 1939. In short, bubonic plague is here ready to flare, but thanks to the eternal vigilance of California and United States health authorities, it is held in abeyance.

We join with our contemporary, the *Canadian Journal of Comparative Medicine*, in calling attention to the fact that the world of today may be laying the foundation for a similar visitation.

Economical Rations for Dogs*

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THE COST of feeding dogs is an important matter to dog breeders. In response to requests from dog owners in Alabama to help them reduce feed costs this laboratory developed the Auburn ration[1] in 1932. This ration was tried in a number of kennels and the results were sufficiently satisfactory in showing that the home-mixing of dog rations from dry ingredients was practical and economical. An experimental kennel was established in 1936 and a series of experiments to determine whether the Auburn ration could be simplified or improved was undertaken. The most significant results of these experiments to date are reported in this paper.

Results of Feeding Experiments

The Auburn ration was used as the sole stock ration for the breeding bitches in an experimental kennel of purebred Foxhounds for three and one-half years. During this time over 500 dogs were raised. Some of the bitches produced seven litters during this period. The average was ten healthy pups to the litter. Experiments in which this feed was given as the sole ration for three generations did not reveal any deficiency. The results demonstrated that the Auburn ration is a complete nourishment for dogs.

There are several reasons why it was thought advisable to attempt to simplify this ration. It contains a large number of ingredients, some of which are expensive and difficult for the average dog owner to obtain. In some cases, it is necessary to buy large amounts of some of the ingredients used only in small amounts in the ration. It is possible that these ingredients would deteriorate before they could be used up. Furthermore, the ration is somewhat bulky and may not furnish enough energy for hard-working dogs. It was apparent that this ration would be improved if made simpler and less bulky.

In order to determine whether a simpler dog food could be developed with a similar nutritive value, a large number of rations were formulated and fed to dogs as the sole ration. The composition of each of the rations producing the most significant results is given in table I. The details of the care and feeding of the dogs have been published elsewhere.[2] All of the rations had approximately the same calcium and phosphorus content; Ca = 1.2 per cent and P = 0.8 per cent. They all contained approximately 20 per cent protein except rations 1 and 2. The rations were mixed with water and fed raw or baked in the form of bread at 400°F. for one and one-half hours.

VARIOUS RATIONS USED

The formulation of ration 1 was based on the belief among hunters that Foxhounds can be raised on a diet of cornbread supplemented with buttermilk. The dogs receiving this ration grew very poorly and became emaciated. No improvement was obtained when the level of milk powder was increased to 20 per cent and the protein was increased to 20 per cent by the addition of casein. These results indicate that Foxhounds can not be raised in kennels on cornbread supplemented with milk.

Ration 2 differed from ration 1 only in that 20 per cent of wheat shorts replaced an equal amount of yellow corn. The dogs receiving this ration grew considerably

*From the Laboratory of Animal Nutrition, Alabama Polytechnic Institute.

The F. E. Booth Company of San Francisco, Calif., and the American Dry Milk Institute of Chicago, Ill., furnished generous supplies of Sardilene (sardine) oil and skimmilk powder, respectively, for these experiments. Cod liver oil may be used in these rations just as effectively as sardine oil, but the present market price of the former renders its use almost prohibitive.

[1]Salmon, W. D.: Dog-feeding suggestions. Ala. Agr. Exp. Sta. Leaflet 13 (1935).

[2]Koehn, C. J.: Canned dry dog food as a source of energy for dogs. Vet. Med., xxxiv (1939), p. 108.

TABLE I—Percentage Composition of Experimental Dog Rations

INGREDIENT	AUBURN* RATION	1	2	3	4	5	6†	7	8	9†	10†	11	12
Yellow corn	35	86	66	44	56.5	56	58	58	60	46	55	43	47
Wheat shorts	20		20	20	20	20	20	20	20	20	20	20	20
Wheat bran	10												
Meat scrap	10					18	20				10		5
Fish meal	10				17			20					5
Tankage									18				
Peanut meal										29	12		
Cottonseed meal												27	15
Soybean meal				27									
Skimmilk powder[2]	10	10	10	5	5	5						5	5
Bone meal	2	3	3	2.5						2.5		1	
Alfalfa meal	2												
Salt	1	1	1	1	1	1	1	1	1	1	1	1	1
Limestone				0.5	0.5					0.5	1	2	1
Sardine oil							1	1	1	1	1	1	1

*Found to be complete for growth, maintenance and reproduction.
†Found to be complete for growth and maintenance.

better than those receiving ration 1 and they appeared to be in good health at the end of a year. Although the addition of wheat shorts added considerably to the nutritive value of the ration, the dogs still did not grow as well as those receiving the Auburn ration.

Since rations 1 and 2 were obviously low in protein, the protein level in rations 3, 4, and 5 was raised to 20 per cent by the addition of soybean meal, fish meal and meat scrap, respectively. As a matter of economy the skimmilk powder was reduced from 10 to 5 per cent. The dogs receiving these rations grew better than those receiving ration 2. All dogs on rations 3 and 5, however, developed severe symptoms of rickets after six weeks. This observation is interesting because dogs exposed to sunlight and receiving adequate amounts of calcium and phosphorus do not need extra vitamin D. The dogs receiving ration 4 which contained fish meal as a source of protein did not develop rickets. Evidently the fish meal contained enough vitamin D to prevent this condition. This explains why rickets does not develop in dogs fed the Auburn ration. It contains 10 per cent of fish meal.

Since rations 3 and 5 were shown to be deficient in vitamin D, another series of experiments was conducted in which 1 per cent of sardine oil[1] was added to the Auburn ration and to each of the other two rations. No significant difference in growth was noted in dogs receiving the Auburn ration with or without sardine oil. When the sardine oil was added to the simplified rations they produced as good growth as did the Auburn ration and no rickets was observed. As the addition of sardine oil proved beneficial, this was adopted for growing dogs.

The skimmilk powder in these rations is the most expensive ingredient and the one most difficult to obtain by the average dog owner. If this ingredient could be left out without reducing the nutritive value considerable economy and simplification would be effected. Experiments in which the Auburn ration was fed with and without skimmilk powder demonstrated that this ingredient was not essential for growth and maintenance. Reproduction, however, was unsatisfactory in the group receiving the Auburn ration without skimmilk powder. Ration 6, containing meat scrap as a source of protein, was also found to be nutritionally complete for growth and maintenance without skimmilk powder. Rations 7 and 8, however, produced inferior growth. Half of the dogs died before the experiment was terminated.

Since it is generally believed that dogs can not be raised without some animal protein, and that they can not subsist without raw meat, it was decided to determine if dogs could be raised on a ration in which

all of the protein was derived from vegetable sources. Such a diet (ration 9) was formulated. In this ration most of the protein was furnished by peanut meal. The only animal products used were 2.5 per cent of steamed bone meal and 1 per cent of sardine oil. The pups on this ration made excellent growth and developed into normal dogs.

Ration 10, a simple ration in which a combination of vegetable and animal protein supplements was used, also gave satisfactory results.

These results show that rations 6, 9, and 10 are complete for the growth and maintenance of dogs when fed without any supplementation. It is not known, however, whether these rations are complete for reproduction. The effects on reproduction are being studied at the present time. No diarrhea or constipation was observed.

COOKED VERSUS RAW RATIONS

It has long been a question whether cooking dry dog rations is necessary. Experiments in this laboratory have shown that there is a distinct increase in food requirement of dogs receiving raw food over those receiving the same ration cooked. This increase in the efficiency of the cooked food amounted to as much as 30 per cent for the Auburn ration. The improvement is probably due to a break down of the cellular structure of the grains rather than to an increase in the nutritive value of the constituents. The cooked food appeared to be more palatable than the raw food. Frequently, at the start of the experiment the dogs receiving the raw food voluntarily restricted their food intake for a few days. After they became accustomed to the raw food, however, they ate more, grew well and appeared as healthy as the dogs receiving the cooked food. Better reproduction, however, was obtained in dogs receiving the cooked ration.

It was found necessary to cook rations containing soybean meal because this ingredient caused diarrhea when fed raw. Cooking the ration remedied this to some extent but did not completely overcome it.

TOXICITY OF COTTONSEED MEAL FOR DOGS

Cottonseed meal is a protein concentrate of high biological value. It, however, contains gossypol, which is definitely toxic in swine. In order to determine the value of cottonseed meal in the nutrition of dogs, two groups of dogs were placed on ration 11; one group received the food cooked and the other raw. Those dogs receiving the raw food ate sparingly, became emaciated and all died within eight weeks. The dogs receiving the cooked food ate well and made good gains in weight. Half of the dogs in this group, however, died before they were one year old. It is interesting to note that the largest and most active dogs died first. When the skimmilk powder was omitted from the cooked ration all of the dogs died within a year. Again, the most healthy appearing dogs died first. It appears that the skimmilk powder had some protective action against the gossypol toxicity. Cooking the ration evidently converts gossypol into a less toxic state. Dogs receiving ration 12, in which the level of cottonseed meal was lowered to 15 per cent, survived for the duration of the experiment, which was one year.

Until more is known of its toxic effects cottonseed meal is not recommended for dogs. Only in a few cases were any symptoms noted before death. Most of the dogs died unexpectedly when they were apparently in good health. In the few cases where symptoms were observed, the dogs were lethargic several hours before death. Terminal symptoms were irregular, labored breathing and coma.

FOOD REQUIREMENTS OF DOGS

The daily food requirement of dogs receiving these rations depends on the age, size, activity and physical condition. It has been shown in this laboratory that young growing dogs require about three times as much food per pound of body weight as the same dogs at maturity and that the food requirement of bitches is

doubled during lactation.[2] For maintenance, a 50-pound mature dog was found to require about 1.75 pounds of ration per day when the ration was cooked. Smaller dogs required proportionately less at maturity. When the raw food was fed, slightly more was required. In general, a dog should be fed enough food to maintain good flesh but not cause obesity.

STORAGE OF FEEDS

These dry rations may be made up in large amounts and stored for several months without deterioration occurring if proper precautions are taken. They should be kept in a cool, dry place in closed containers. If trouble is encountered with weevils, a small bottle of carbon bisulfide loosely stoppered with cotton should be placed in the container. When the ration is to be stored for several months, the sardine oil should not be incorporated into the whole mix at one time. Only enough feed to last a week should be mixed with sardine oil because the oil turns rancid with consequent loss of vitamin A.

COST OF FEEDING

The cost of these rations per hundred pounds, at the present market prices of feeds, is as follows: ration 6, $2.72; ration 9, $2.20; ration 10, $2.45; Auburn ration, $2.52. Without the sardine oil the cost of rations 6, 9 and 10 is $2.30; $1.78, and $2.03 per hundred pounds, respectively. The latter figures are quoted because mature dogs not in gestation or lactation do not require sardine oil in these rations. The cost of the rations is considerably less than that of commercial dry dog feeds which sell for $5.00 to $7.00 per hundred pounds.

The costs of these simple dry rations are demonstrated more clearly by comparing them with that of feeding canned dog food. The average commercial canned dog food contains 72 per cent water and retails for 8.3 cents per pound can. Calculated on a 10 per cent moisture basis, which is the average moisture content of the dry rations, this food costs $26.67 per hundred pounds.

Summary

The Auburn ration has been shown to be complete in all respects for the nutrition of dogs. Simpler rations such as rations 6, 9 and 10 are adequate for growth and maintenance. Whether these simple rations are adequate for reproduction in dogs is not known but is being investigated.

The sardine oil may be omitted for mature dogs.

Animal proteins are not essential for growth and maintenance; dogs may be raised from weaning to maturity on a ration composed of vegetable products supplemented with necessary minerals and sardine oil.

Dry mixed rations may be moistened and fed raw or they may be baked in the form of bread. The food is more palatable and is utilized more efficiently when baked than when fed raw.

Rations containing soybean meal cause diarrhea if fed raw, but this is overcome to a great extent by cooking the food.

Cottonseed meal has been shown to be toxic if fed in large amounts. It should not be used in dog rations.

Dogs require from one-half to one and three-fourths pounds of these dry rations daily depending upon the size, age, activity, and physical condition.

The cost of these rations is less than half that of commercial dry feeds and about one-tenth that of canned dog foods.

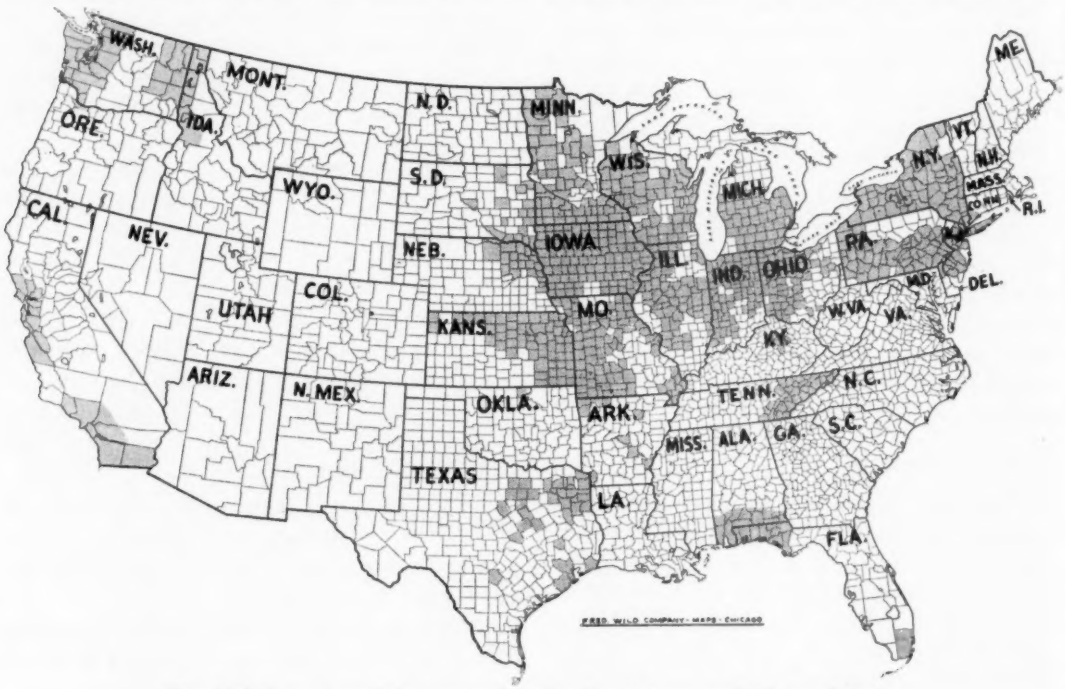
A New Chick-Embryo Vaccine

The newest chick-embryo vaccine is anti-measles vaccine developed at the Medical School, University of Pennsylvania, and Squibb's Institute of Medical Research. The virus of measles is so modified by passage through chick embryos that upon injection into children it produces a mild type of measles that is sometimes scarcely noticeable.

Reports indicate that vaccinated children resist both experimental injections of the virus and exposure to measles cases, while the controls contract the disease.—*From Science News Letter, Sept. 28, 1940.*

Organized Veterinary Medicine in the United States*

ACCORDING to veterinary history,[1] the first veterinary society to be organized in the United States was named the American Veterinary Association. It was founded in Philadelphia, May 7, 1854. Next in line was the Boston Veterinary Association (now the Massachusetts Veterinary Association), organized in 1857. It was these two groups that laid the foundation for the formation of the United States Veterinary Medical Association, the antecedent of the American Veterinary Medical Association, which now has 6,200 members.



The shaded areas are those covered by local veterinary medical associations.

The idea of organizing veterinarians has taken root, and today every state has a state organization. There are 89 district or local associations and 15 other associations which draw their membership from more than one state. All associations, taken as a whole, contribute $75,000 each year in dues. The American veterinary population is estimated to be approximately 12,500.* Each organized member of the profession contributes approximately $15 annually toward the cause of organized veterinary medicine. This amount would be adequate if the majority of veterinarians contributed, but this is not the case. The total membership of the 48 state associations and that of the District of Columbia is 6,238. Twenty-eight states have local associations and the total membership of these local groups, except in a few states, does not exceed the membership of the state organization. It is apparent, therefore, that about one half of the veterinarians in the United States are organized. The other half are "hitch hikers."

The federacy of associations provided by the revised constitution should aid materially in cementing the state and national associations more firmly. The pressing problem is to link the local association to

*This article was prepared by Eugene B. Ingmand, D.V.M., as one of the statistical projects of the Association.

[1]Bierer, B. W.: American Veterinary History, Part II (Bert W. Bierer, Baltimore, 1940), p. 36.

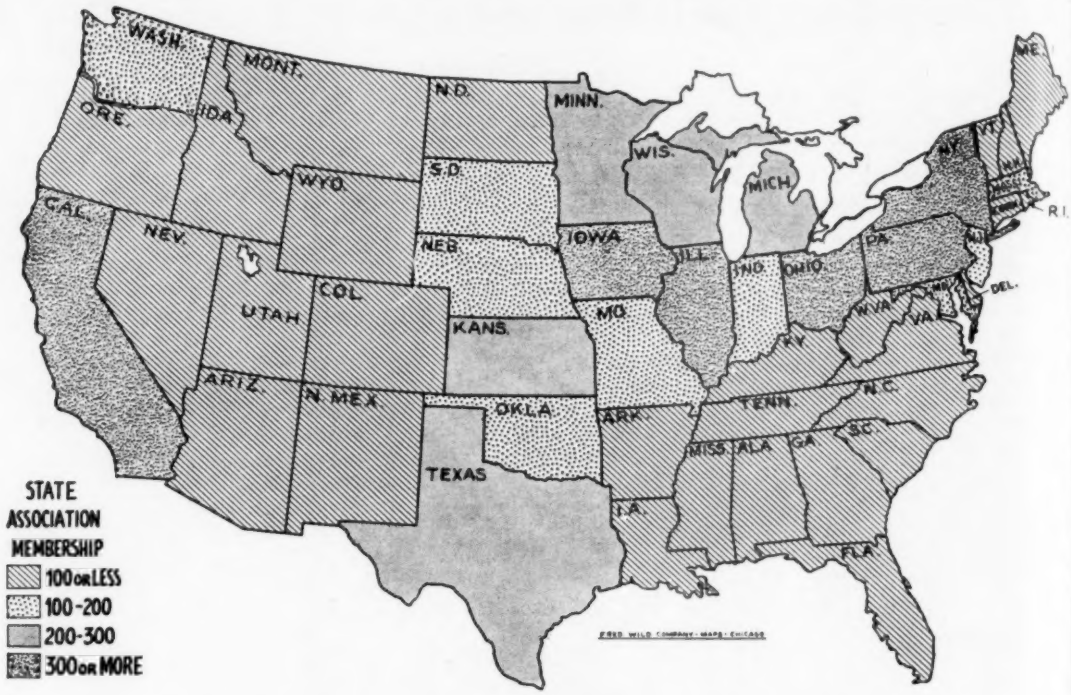
*At present the AVMA maintains an active list of 11,318 American veterinarians.

Statistics—State and National Associations

STATE	ANNUAL DUES	NUMBER OF MEMBERS		VETERINARY POPULATION
		STATE	AVMA	
Alabama	$ 5.00	56	105	148
Arizona	5.00	27	24	35
Arkansas	3.00	50	45	65
California	2.00	320	457	726
Colorado	5.00	54	105	164
Connecticut	4.00	60	77	116
Delaware	None	27	14	27
District of Columbia	2.00	67	67	22
Florida	5.00	75	80	122
Georgia	3.00	45	87	181
Idaho	3.00	57	40	66
Illinois	5.00	322	229	790
Indiana	5.00	185	190	602
Iowa	10.00	550	389	804
Kansas	3.00	210	178	359
Kentucky	3.00	51	73	129
Louisiana	3.00	60	50	97
Maine	4.00	25	29	55
Maryland	2.50	100	97	177
Massachusetts	5.00	125	110	154
Michigan	3.00	222	198	492
Minnesota	5.00	285	263	430
Mississippi	3.00	44	45	91
Missouri	3.00	183	179	336
Montana	5.00	37	43	56
Nebraska	5.00	161	134	299
Nevada	3.00	15	14	19
New Hampshire	3.00	34	21	50
New Jersey	3.00	132	163	257
New Mexico	5.00	30	19	27
New York	10.00	300	444	921
North Carolina	3.00	95	83	138
North Dakota	3.00	63	49	89
Ohio	5.00	416	360	713
Oklahoma	5.00	115	110	152
Oregon	3.00	55	74	107
Pennsylvania	2.00	385	322	574
Rhode Island	2.00	28	17	25
South Carolina	2.00	60	38	54
South Dakota	2.00	107	66	114
Tennessee	5.00	85	74	107
Texas	5.00	270	223	415
Utah	2.00	38	38	57
Vermont	5.00	46	25	53
Virginia	3.50	92	92	146
Washington	3.00	130	112	180
West Virginia	2.00	32	36	70
Wisconsin	3.00	287	157	427
Wyoming	1.50	25	19	35
TOTALS		6,238	5,864	11,273

that of the state. In some states little concern has been given to allocation of definite areas for each group. Overlapping of geographical boundaries is all too common. In addition, more serious consideration should be given to the frequency of meetings. Some associations do not meet often enough. Factors that govern this point include: number of members responsible for the income, proximity of members to a central meeting place, availability of competent speakers and climatic conditions.

It is advisable to compensate secretaries for their efforts, particularly those of the state associations. Moreover, they should be provided with at least part-time clerical assistance and funds for office expenses. If possible the association should have a



Relative numerical membership of state veterinary medical associations.

mimeograph and a stencil list of the membership.

Too much attention can not be paid to these local groups, for they are the links needed to build up a powerful federacy. The basis of the successful national organizations is these far-flung, small groups. The success of the medical profession revolves about an organization of county and state groups closely knit into the national, as exemplified in the American Medical Association. In our case this plan is feasible in most states. There are, however, certain states in which the veterinary population is so small and the distances so great that maintaining local associations is out of the question.

The problem can be overcome only by perfecting the system of veterinary organizations, that is, to organize the 6,000 or more non-members. By bringing this group into the realm the income can be almost doubled. Of still greater importance is the fact that it is the unorganized veterinarians who need contact with their fellow men. Besides the intellectual and social aspects of veterinary societies, it is vital that a unified, nationwide front be perfected. Inasmuch as there are many outside influences striking at the profession, organization is the only means of protecting the veterinarian.

The argument that the national and the state and local associations are not worthy of support is not justifiable in any case, for it should be remembered that the success of an organization is largely dependent upon the attitude and enthusiasm of its members. Then, too, there is a financial limitation—given more income, more effort can be exerted on behalf of the profession. The AVMA, for example, has certain important fixed costs regardless of whether the membership is 6,000 or 12,000. Though the operating cost will increase for an additional 6,000 members, a larger fund derived from an increased income can be set aside for promotional work.

As veterinarians we must firmly fix in our minds the necessity of building up a strong national association; it must lead the way, it must coördinate the activities of the

CLINICAL DATA

Laboratory findings should not be made a reason for superficial clinical research.

Acaprin in the Treatment of Piroplasmosis (=Texas Fever)

G. A. ROBERTS, D.V.S.
Ciudad Trujillo, Dominican Republic

IN APRIL of this year a breeder imported eleven crossbred Swiss bulls from a tick-free area in Puerto Rico and another importer brought in nine purebred Shorthorns from the United States. The latter part of April one of the Shorthorn bulls developed piroplasmosis. Trypan blue in 2-oz. doses was promptly administered for three consecutive days. Because the animal was losing ground in spite of the prompt treatment, 4 cc. of acaprin was administered intravenously, but it was too late. The animal died a few hours later. At the same time a young bull began to appear dull. His temperature was 106.5° F. and the urine had a reddish tinge. Two cc. of acaprin was given and before the needle could be withdrawn from the vein, the bull dropped to the ground as if dead. Fortunately, we had intended to administer calcium gluconate and no time was lost in doing so. In an hour the animal was up and eating. The temperature was 104° F. and the urine much clearer.

About this time, piroplasmosis began to show up among the Swiss bulls across the road. The first bull died because treatment was not given soon enough. Within two weeks nine of the remaining ten, with temperatures above 105° F., were given 2 to 4 cc. of acaprin. Six of the nine exhibited marked hemoglobinuria; two were given a second dose and all made rapid recoveries. The rapid action of acaprin in piroplasmosis was marvelous. One of the young Shorthorn bulls later showed marked hemoglobinuria with a temperature of 107° F. Within three hours after the administration of acaprin the urine was clear and the temperature 104° F.

All four of the Shorthorn cows pictured above became infected with piroplasmosis. They responded promptly to acaprin but died six to ten weeks later from anaplasmosis.

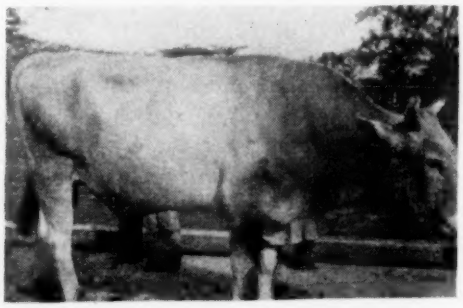
Anaplasmosis is an entirely different type of malady. Some cases are mild enough that no special treatment is necessary, but the more severe cases do not respond to any of the treatments we have tried—and we have used about everything ever recommended. All of the four adult Shorthorn cows died from anaplasmosis three to four months after recovering from piroplasmosis. None of the Swiss bulls developed a severe attack.

(Continued from preceding page)

federacy. The state associations must focus their attention on state questions in coöperation with the local groups and in turn with the national. The local associations must provide the members for the state and national associations and, above all else, personal contact with the problems of the practitioner.

Three of the young Shorthorn bulls have had temperatures of 104° to 105° F. for the past month, but are now considered out of danger. Some cases of anaplasmosis had relapses of piroplasmosis at the same time.

There are factors other than ticks to consider when attempting to improve cattle and other species of animals in tropical and subtropical countries. It is only within comparatively recent years that our people began to realize that inherited productivity



Swiss grade bull suffering from piroplasmosis. The temperature was 107.5° F. and hemoglobinuria was present. The animal recovered promptly following the use of acaprin.

of animals from cold climates is more than offset by their lack of adaptability to the conditions of warm countries. Improvement in our native animals can be made in the first and sometimes the second generation, but further crossing with imported stock from colder climates invariably results in lowered production. This influence was noted in Brazil 25 years ago when efforts were made to develop new breeds that would be adapted to the environment of that country. As yet this country has not started such a program, but importers are beginning to realize the futility of importing breeding animals from colder climates.

The medicine of the civilizations of Mexico and South America preceding the coming of the Spaniards gave the world quinine for malaria and maggots for septic wounds. What other phenomenal cures of the same value these populations may have had are not known because the Spaniards destroyed their records and introduced the European system of medicine into the Western Hemisphere.

Heatstroke

On a hot summer afternoon in a temperature of 100° F., an 8-year-old gelding of 1,500 lb. working in a team excavating dirt for grading began to stumble, reel and stagger. After leaning against his mate he sank to the ground and was unable to rise. His temperature was over 110° F., respiration 80, and pulse too fast to count.

I administered a proprietary diaphoretic, and repeated the dose in 30 minutes. Water was applied to the head and neck and enemas of tap water given until the temperature was reduced to 106°. Calcium gluconate solution intravenously and strychnine subcutaneously were given. The next morning the horse was on his feet but would walk blindly into objects in his path. Having recovered from this state of stupidity in three weeks, he was again put to work. Why did this horse not die?—*C. C. Dobson, Indiana.*

Reply.—Temperatures of heatstroke cases running above the gradation of the clinical thermometer are common in all animals. Such high bursts of temperature are not serious if promptly reduced with cold water baths.

Vitamin C in Reproductive Failures

The function of vitamin C, once believed to be practically nil in domestic animals, is now acknowledged to be essential to normal reproduction. Its stimulating action upon the gonads of both sexes is a recent pronouncement from the field of research that is attracting attention in clinical veterinary medicine.

Though at one time thought to be but the specific preventive of clinical scurvy in man, the ascorbic acid of the blood and tissues is now being recognized for its contribution to normal metabolism in domestic animals.

The Chester White is the oldest breed of purebred hogs in the United States. It was developed in Chester county, Pa., about 1920 from a pair of hogs imported from China.

Salmonella Suipestifer Infection in Canaries

IRVING E. ALTMAN, D.V.M.
Brooklyn, N. Y.

ABOUT September 1, 1939, a flock of 10 adult male canaries, 20 adult females and 140 young birds of both sexes began to sicken. One bird died the first week, three the second and approximately 25 the third week. Thereafter, three to four birds died each week. On October 5, 110 birds remained.

These birds were quartered in three rooms. Twelve males and 12 youngsters placed in room 1 six weeks previously, were healthy; the 18 adults in separate cages in room 2 suffered no losses until the first part of October, when seven were destroyed. Altogether 80 youngsters in room 3 died during October and the first part of November.

The owner said that the birds puffed up, developed convulsions and died in two to three days. Postmortem examination of a number of the canaries showed the spleen to be enlarged from three to four times the normal size in every case. The heart, lungs and kidneys were normal. In one case the upper part of the intestine was inflamed. Since the birds died quickly, they were all in fair or good condition.

On October 16, 1939, some live birds were sent to Dr. Herman of the New York Zoölogical Park and to K. F. Hilbert of the poultry research laboratory at Farmingdale, N. Y. Both reported the condition to be a Salmonella infection. At a later date, P. R. Edwards of the University of Kentucky identified the pathogen as *Salmonella suipestifer*.

Dr. Hilbert prepared an autogenous bacterin (nephelometer No. 1) which was injected into the remaining birds on October 28, 1939. Up to this point the treatment at home consisted largely of sanitary measures. A few of the birds which were taken to the hospital did not respond to various therapeutic measures.

On October 28, 1939, 50 birds, young and old, received 0.1 cc. of the bacterin. Three other birds, designated as A, B and C, received .15 cc., 0.2 cc. and .25 cc., respectively. Six birds were left as controls, one of which was apparently sick on the 28th and died on the 30th of October. On November 6, 1939, the 50 birds received .15 cc. of the bacterin, bird A, 0.2 cc., bird B, .25 cc., and bird C, 0.3 cc. Both B and C had a severe reaction, being unable to stand on the perch for any length of time. They showed a decided ataxia and quivered constantly; both recovered in 24 hours. This indicated to me that 0.2 cc. of the bacterin was the maximum dose the birds could tolerate. On November 13, 1939, the 50 birds and birds A, B and C each received 0.2 cc. of the bacterin. All remained well, as did the five controls. The owner reported on April 28, 1940, that the remaining birds were all in normal breeding condition. Since no new birds had been introduced into the building at least one year prior to this attack, the source of the infection was not ascertained.

This, I believe, is the first case of *S. suipestifer* infection reported in canaries.

Nonpulmonary Tuberculosis in Children

Fifty children up to 14 years of age were hospitalized on account of nonpulmonary tuberculosis. Among them were 14 cases of cervical adenitis, 22 cases of bone and joint disease, 12 cases of meningitis, and 2 cases of primary abdominal tuberculosis. In the work of differentiating the type of tubercle bacillus responsible for these 50 cases, the bovine type was found in 14 of the cases of cervical adenitis, 4 of the cases of bone and joint disease, 3 of the cases of meningitis, and in both of the primary abdominal cases. [*Abst., J. A. M. A., cxv (Sept. 21, 1940), from Journal of Hygiene, London.*]

A Convenient Field Test for Albuminuria*

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St. Paul, Minn.

NUMEROUS REQUESTS have been received for a simple field test for albuminuria since the recent report by Freer and Hayden[1] on albuminuria in dairy cows.

The test annotated herein is a slight modification of the usual sulfosalicylic acid tests described in clinical chemistry manuals. The reagent is a 20 per cent solution of sulfosalicylic acid in distilled water (6 Gm. of sulfosalicylic acid in water up to 30 cc.). A small amount of precipitate usually forms in this reagent on standing, but this does not interfere with the test. Sulfosalicylic acid is inexpensive and may be obtained from nearly any chemical supply company.

The test for albuminuria is conducted by adding 1 cc. of the sulfosalicylic acid reagent to 4 or 5 cc. of urine in a test tube (⅝-in. diameter) and shaking adequately. The degree of turbidity which develops is roughly proportional to the amount of albumin present in the urine. The final reading should not be made until approximately three minutes after the reagent is added. Occasionally urine specimens are encountered which are slightly turbid. In such cases a sample of the untreated urine in a second test tube may be used as a control to detect any increase in turbidity due to the addition of the reagent. This permits the detection of significant amounts of albumin in cloudy urine.

In recording the reactions or degree of turbidity, it is customary to grade the reactions into six classes from negative (—) up to very heavy cloudiness (++++). The following reactions with the approximate albumin percentages represented are: — (no alubumin), ± (0.015%), + (0.04%), ++ (0.08%), +++ (0.25%), and ++++ (0.5% or higher). A uniform classification of this type is desirable particularly from the standpoint of case reports by various clinicians.

TABLE I—Albumin Standards

Method I		Method II		Reaction	Approximate Concentration of Protein
Serum	Urine	Serum	Urine		
	5 cc		5 cc.	—	
.01 cc.	5 cc.	1 drop	25 cc.	±	.015%
.025 cc.	5 cc.	1 drop	10 cc.	+	.04%
.05 cc.	5 cc.	1 drop	5 cc.	++	.08%
.15 cc.	5 cc.	3 drops	5 cc.	+++	.25%
.3 cc.	5 cc.	6 drops	5 cc.	++++	.5%

In order to become familiar with the degree of turbidity for the various reactions, it is desirable to prepare a series of standards with negative urine by adding varying amounts of blood serum (bovine serum or anti-hog-cholera serum). Serum globulins are precipitated by sulfosalicylic acid in the same manner as serum albumin. Therefore, blood serum, which is fairly uniform from the standpoint of total protein concentration, serves as a convenient source of protein for the preparation of such standards. With a serological pipette graduated in .01 cc. or with a medicine dropper, either of the two methods shown in table I may be used to prepare the standards indicating

*Paper No. 1842, Scientific Journal Series, Minnesota Agricultural Experiment Station; contribution from the Division of Veterinary Medicine.

[1]Freer, G. H., and Hayden, C. E.: Cornell Vet., xxx (1940), p. 57.

the various reactions with the sulfosalicylic acid reagent.

The mucin normally present in fairly large amounts in equine urine gives only a very slight turbidity with the sulfosalicylic acid reagent; therefore, the test described may be used on equine as well as bovine urine. This test is more sensitive than albumin tests in which acetic acid or nitric acid with heat is used. In our experience it is not uncommon to obtain tests showing slight turbidities (up to ± reaction) on specimens from apparently normal cows.

Since the 1 cc. of reagent used for the test does not need to be measured with great accuracy, the reagent may be carried in a small dropper bottle and used in an amount equivalent to 20 drops. A simple test for albuminuria of the type described might be considered as a desirable addition to the nitroprusside test kit or sets which many veterinarians carry for acetonuria tests.

The Mode of Action of Sulfanilamide

IN VIEW of the extraordinary therapeutic value of sulfanilamide, medical scientists are naturally curious to know just how it goes about making spectacular cures of erstwhile lethal infections.

The consensus is that the sulfonamides alter the body tissues and fluids in such a way as to render the environment biochemically unfavorable for the multiplication of bacteria. But, admittedly, the chemistry of the unfavorable state remains unknown. At the present time one must be contented with this so-called bacteriostatic action as the explanation. In losing their ability to multiply, the bacteria are depressed to a degree that enables the natural defense to dispose of them. This, of course, is but a theoretical generality, a logical guess based upon previously acquired knowledge of pathogenic bacteriology dating back to Metschnikoff, Ehrlich, Virchow, Senn[1] and other stellar figures of the Pasteurian period. There is nothing new about the vulnerability of weakened bacteria to the raids of the defending forces.

Factors influencing the action are (1) the number of bacteria in the infected zone and (2) the concentration of the chemical in the blood. The first is an old observation (Senn, Lister). Dosage of bacteria is well known for its effect upon the seriousness of an infection, but concentration in the blood of the curative agent required to master an infection was never before as precisely defined as in the studies of sulfanilamide therapy. For optimal results, definite concentrations are the guide, not only to curative effects, but also to the tolerance of the patient.

Lockwood[2] points out the activity of the defenses in the infected area and the amount of proteolysis of tissue accompanying the inflammatory process as influences modifying the action of sulfanilamide. But has not defensive activity been set down as a basic postulate since the earliest dates of germ pathology? And the fragmentation of tissues which prevents a germicide drug from reaching the hotbed of an infection could hardly be called something new to propose in the study of the remote dynamics of an antiseptic, orally administered. Obviously, scientifically proved pharmacodynamics of sulfanilamide lies in the future.

[1]Senn, Nicholas: Surgical Pathology (1899), p. 75.

[2]Lockwood, John S.: Sulfanilamide in surgical infections. J. A. M. A., cv (Oct. 5, 1940), p. 1190.

Soy Beans and Cow Peas Compared

Assays made by Halverson and Sherwood* of the North Carolina Agricultural Experiment Station showed that soy beans *(Soja max)* and cow peas *(Vigna sinesis)* do not contain appreciable amounts of vitamin A. In international units of vitamin B_1, soy beans were found to contain 3.2 to 4.8 per gram, and cow peas 2.3 to 3.7 per gram.

The samples were carefully chosen and kept in cold storage until assayed. As expressed in carotene, both soy beans and cow peas were found to contain but 0.4 to 0.8 international units per gram.

*Journal of Agricultural Research, lx, Jan. 15, 1940, pp. 141-144.

Embryonal Nephroma in a Dog

WILLIAM L. WEITZ, D.V.M., and ROBERT B. McCLELLAND, D.V.M.
Buffalo, N. Y.

ALTHOUGH not of great clinical or economic importance, the embryonal nephroma is interesting because of its obscure histogenesis and infrequent occurrence. The most common synonym is embryonal adenosarcoma of the kidney.

It has been reported in chickens, swine, cattle, rabbits,[1] children,[2] and rarely in adults. In animals the tumor is usually discovered at autopsy, seldom causing symptoms recognizable clinically.[1]

Fig. 1. Adenomatous portion of embryonal nephroma in the renal cortex of a dog.

In discussing histogenesis, Herman[3] states, "It seems rational to ascribe the presence of embryonal adenosarcoma to neoplastic metamorphosis of developmental inclusions, either from the wolffian body (Birch-Hirschfeld) or from adjacent mesenchyme (myotome or sclerotome) (Wilms)." Feldman[1] and Wollstein[4] accept Wilms' hypothesis.

Metastasis may occur.[1,5,6] The sizes of the neoplasms vary from minute foci to enormous lobulated masses.[1]

According to Ewing,[2] "the embryonal structure is the most distinguishing feature and presents a great variety of tissues, usually suggesting abortive renal elements. The usual composition is of isolated tubules of high cylindrical or cuboidal cells with indistinct lumina, surrounded by broad zones of undifferentiated spindle cells."

REPORT OF A CASE

During November 1939, a Dachshund, male, 5 years old, was presented at our clinic with a history of arched back, and pain upon ascending stairs. The appetite was poor and during a period of ten days his temperature varied between 100° and 104° F. The prostate seemed enlarged but was not painful upon palpation. Treatment was unsuccessful and the owner ordered the animal destroyed.

Upon autopsy the prostate was found to be enlarged, firm and nodular. The kidneys appeared normal. A pale area about 0.5 cm. in diameter was noted just beneath the capsule of the left kidney.

The sectioned prostate showed cystic hypertrophy of the glandular portion with an increase of fibrous stroma. There was an acute congestion of the renal tissues. Fortunately, the kidney was sectioned through the above-mentioned small, pale area, for it proved to be neoplastic in nature.

A portion of the tumor consisted of single layers of round and oval cells in a fibrous stroma (fig. 1). These were arranged in a papillomatous manner. In another area the cells were spindle-shaped and could not be differentiated from those of the stroma. Here, though the papillary arrangement was not evident, there were

[1]Feldman, W. H.: Neoplasms of Domesticated Animals. (W. B. Saunders Co., Philadelphia, 1932.)
[2]Ewing: Neoplastic Diseases. (W. B. Saunders Co., Philadelphia, 1938.)
[3]Herman: The Practice of Urology. (W. B. Saunders Co., Philadelphia, 1938.)
[4]Wollstein: Quoted by Feldman.[1]
[5]Day. Quoted by Feldman.[1]
[6]Mathews: Quoted by Feldman.[1]

glandular acini containing a homogeneous, pink material. No capsule could be demonstrated.

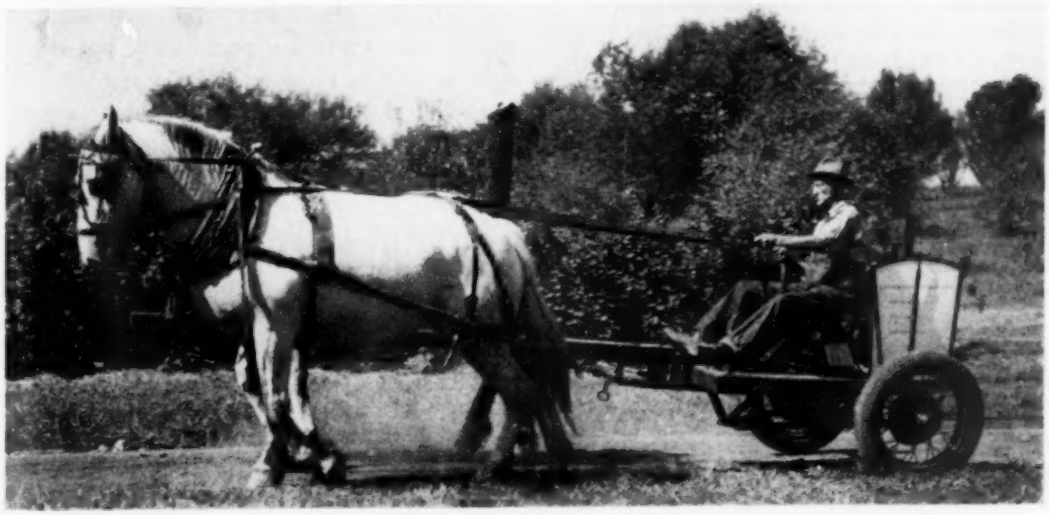
Carl F. Schlotthauer of The Mayo Foundation, Rochester, Minn., Norman Elton of the Millard Fillmore Hospital, Buffalo, N. Y., and Eugene Burck of the New York State Institute for the Study of Malignant Diseases, Buffalo, N. Y., confirmed the diagnosis of embryonal nephroma. There is ample reason to believe that the condition of the prostate, and not the neoplasm, caused the symptoms evidenced by the dog. We are of the opinion that the renal congestion was the result of violent death.

As far as we can determine [article submitted April 12, 1940] no other case of embryonal nephroma has been reported in a dog.

Pull-Meter Perfected at University of Tennessee

M. JACOB,* V.M.D.

Knoxville, Tenn.



The pull-meter.

The illustration above shows a team hitched to a pull-meter, which measures the number of pounds a team can pull. The machine is constructed from auto parts and is inexpensive. A cable is wound around a drum and one end is anchored to a tree or post. The team starts with a light load, but the cable, in unwinding, gradually increases the load to a point where the team can no longer pull it.

Teams travel about 25 ft. and, if well trained, pull approximately their own weight. This machine was developed in the agricultural engineering department of the University of Tennessee, Knoxville, Tenn.

*Dean, College of Agriculture, University of Tennessee.

Not the least effect of the war now raging in Europe is the shortage of drugs of plant origin. While many of these can be raised in the United States, the drug market has always looked to importation for its supplies. Countless acres once needed to raise forage for horses might, perhaps, be turned to drug-plant culture. The medical profession, drug manufacturers, insurance companies and agriculturalists of the United Kingdom are studying the question.

SURGERY & OBSTETRICS

Abdominal Surgery in the Horse*

JAMES FARQUHARSON, D.V.M.
Fort Collins, Colo.

THE TITLE of this paper might be "Preoperative Procedure Necessary for Successful Abdominal Surgery in the Horse." Any successful surgical operation consists of certain steps, a clinical diagnosis and preoperative, operative and postoperative technic. In veterinary surgery, too much emphasis has been placed on operative technic to the exclusion of the other essential steps. Being skillful is not sufficient. To insure the success of an operation it is important that the operator is qualified to prepare the animal and himself. Too little attention has been given to preparation of the patient, asepsis and after care. A well-executed operation may be "beautiful outwardly but full of uncleanliness within." Little or no progress has been made in abdominal surgery of the horse because certain fundamental principles that doom the operation to failure before it is started have been disregarded. It is commonly believed that invasion of the abdominal cavity of the horse is dangerous and unprofitable. Knowledge gleaned from general conversation and from literature reveals a diversity of opinion as to its practicability and success. Failure has been blamed on shock. It is true that shock may supervene from any operation, from the loss of blood during the operation, or from the formidable character of the procedure, particularly if the animal is a poor surgical risk.

One is also impressed by the fact that emphasis has been placed upon the unfounded supposition that merely open handling of the peritoneum and viscera of the horse means death. Other factors cited in explaining failures are: the size of the animal, the temperament of the species and our lack of skill in control following an operation, the conditions and environment where operations are performed, the thick skin can not be rendered sterile, and sutures too weak to withstand the tension to which they are subjected. There is some truth in some of these arguments; others are erroneous.

Regardless of these explanations, only dire results can be expected when one realizes the manner in which most of these operations have been conducted. Infection is the answer in the majority of instances. Avoid infection and the horse will react to abdominal surgery favorably, provided the animal is a good surgical risk. The practicability, reliability and the clinical significance of such an operation may be a subject of lively controversy. Any surgery is practical, provided it can be done successfully and restores the usefulness of an animal valuable enough to warrant the operation, and is sufficiently remunerative to the veterinarian.

PRE-LISTERIAN WORK CONTINUES

No veterinarian will deny that the important changes in surgical technic, in some of our small animal hospitals within the last ten years, is unparalleled in the history of veterinary medicine. On the contrary, modern large animal surgery is still of the pre-Listerian and immediate post-Listerian era. We accept the universal teaching that surgery on the horse is synonymous with infection. We are pre-Listerian in that we

*From the veterinary division of Colorado State College; read before the Section on General Practice at the 77th annual meeting of the AVMA, Washington, D. C., August 28, 1940.

still expect "good laudable pus" in practically every operation performed on the horse. We are post-Listerian in that we have not advanced since the era of antiseptic surgery. It is true that any infected field necessitating surgery in the horse is still largely treated by antiseptic methods. Nevertheless, in too many instances if more time were spent in preparation of the animal, the surgical field, the instruments, and self, less time and effort would be spent in after care; and anxiety particularly over preventing the common complications of toxemia and septicemia would be notably relieved.

It is not implied that one should be impractical in attempting to obtain primary union in surgery of the horse. There are many operations in which this is impossible. Nevertheless, when primary union is desired it is imperative that aseptic methods be followed minutely. The remarks here, therefore, pertain exclusively to first intention healing and abdominal surgery particularly in the horse.

THE USUAL TECHNIC

Let us consider the general technic that has been used in abdominal surgery of the equine species. Whatever attempts that have been made were along the lines of antisepsis. The field has been closely clipped or perhaps shaved. The skin is washed with some antiseptic, the hands washed and douched in an antiseptic solution. Shrouds are usually wrung out in an antiseptic solution. Instruments are boiled, and then submerged for a few minutes in an antiseptic. When incision is made an antiseptic solution is liberally used in sponging. On closure, drainage is established because of anticipated infection. Where faith is placed in such antisepsis, drainage is rather absurd. When the surgeon inwardly knows that death may result, he has put on the bizarre show of treating the owner, knowing that pus-producing organisms resist an hour or more of exposure to antiseptic solutions stronger than can be wisely used in surgery, why then do we place such unwise confidence in their efficiency?

ANTISEPSIS OVERRATED

Too much emphasis and reliance has been placed on antiseptic surgery. Antiseptics have been overestimated in their ability to destroy bacteria in the wound or to render instruments sterile. Also, there is a false sense of security in the benefits derived from the promiscuous use of antiseptics in flushing wounds during an operation. Such a procedure devitalizes tissues and makes them more susceptible to infection. The axiom in operative surgery should be to start sterile, remain sterile, close sterile, and protect. This means that we should become "asepsis conscious." In order to insure as far as possible a satisfactory result in any justifiable surgical operation the operator must be thoroughly familiar with all the minor details of the modern technic used in preventing wound infection. Improvement can be accomplished only by emulating the human surgeon as far as is practical in this respect.

ABDOMINAL SURGERY IN HORSES

Considering that abdominal surgery in the horse is important one must bear in mind the fact that we are dealing with an animal that is highly susceptible to infection; that the surgical field is favorable for the occurrence of infection; and furthermore, that the usual filthy surroundings under which such operations are performed (stables and barn yards), are teeming with practically all of the bacteria most favorable for infection. As in all major operations, natural resistive power varies with the number and virulence of invading bacteria; the ability of the phagocytes and wound secretions to engage them; upon the amount of foreign material in the wound, particularly blood clots; and finally upon the relative, natural resistance and immunity. In abdominal surgery of the horse primary union is desirable and the most important prerequisite is asepsis. No operation can be absolutely aseptic. Asepsis is a relative term. It means approximate freedom from contamination. The tissues of the body are capable of destroying a certain number of bacteria introduced into a wound. Because of this fact, every

effort should be made to tax the vital resistance of the tissues as little as possible locally and generally against infection. Under the best aseptic technic, the occasional appearance of infection in a long series of cases discloses that the best efforts only approximate the ideal.

THE OPERATING PLACE

The most satisfactory theatre is outdoors in a clean, grassy plot or orchard, provided the weather is warm and there is no wind. The good ventilation secures better hygiene for the operation and animal. In inclement weather it is advisable to operate indoors, in a clean, roomy, well-lighted box stall. In this instance all animals should be removed from the stable to eliminate the stirring of dust. The box stall chosen should be well bedded with clean straw, sprinkled before the operation is started. The advantages of using a box stall or outdoor theatre are that after the operation is completed there is no necessity of moving the animal. When the anesthesia vanishes the subject will get up of its own accord. Operating tables are unnecessary for these operations; in fact, there is the great disadvantage of having the animal flounder around following the operation, and having to be forcibly removed under many handicaps while still semi-anesthetized.

Lack of trained assistants is often a handicap. Before attempting an operation of any magnitude it is necessary that a competent assistant be called, preferably a veterinarian. Laparotomies performed for the simple correction by massage of an impaction can, however, be accomplished without professional assistance.

INDICATIONS

Indications for abdominal surgery are usually morbid conditions of an acute nature. However, there are indications in which the animal can be properly prepared for some time previous to the operation. This invariably enhances the prognosis. The diagnosis should be correct before considering surgical intervention. The value of the animal must warrant the time and expense. The animal should be in such a condition that it is deemed a good surgical risk, and the pathological condition must be capable of being corrected. Considering these prerequisites, any delay in operation of an acute condition makes the prognosis less favorable. Deferring operation in a clear-cut operable case, to substitute other forms of therapy and then operating as a last resort, is not encouraged.

PREPARATION

A well-organized operation requires about one hour of preparation. The prerequisite for success is ability to provide asepsis. This is accomplished by strict attention to sterilization of instruments and materials and to the proper preparation of the animal as well as of the surgeon.

Few veterinarians have access to an autoclave. However, in lieu of this, a pressure cooker is most satisfactory. By this means, instruments may be sterilized as readily in the country as in a hospital. Instruments, towels, sponges, shrouds, and gloves are placed in the pressure cooker or autoclave in reverse order of the manner in which they are to be used. They are subjected to 20 pounds pressure for 30 minutes. The instruments may be boiled in a 1 per cent solution of sodium bicarbonate for 15 minutes.

During the time in which the instruments are being sterilized, the operative field is prepared, the animal anesthetized, and the operator's hands and arms cleansed.

Site.—Except for some specific reason, the left flank or median line is preferred for surgical approach. The right flank is largely occupied by the base of the cecum and considerable difficulty may be encountered in procuring accessible exposure. Instead of using the median line, the incision may be made slightly to the right or left because of increased vascularity and quicker healing. We have been unable to substantiate this theory.

The operative field is shaved and is then subjected to thorough scrubbing with soap and warm water. This is followed by further cleaning the area with ether or ben-

zene until no dirt or color will show on gauze or cotton. This step is followed by the application of alcohol 70 per cent until the time of operation. One should strive in every way to approach as nearly as possible an ideal, aiming at perfect cleanliness. The skin always harbors bacteria, not only on its surface, but also deep in the follicles, where they can not be removed by washing. Therefore, the skin can not be rendered sterile. Wounds most commonly receive infection from the skin.

Regardless of whether the animal is taken outdoors or to a box stall, a casting harness is adjusted, allowing the animal perfect balance until it shows signs of inability to stand due to the anesthetic. This lessens the chances of injury to both animal and men. It is also a means of control as to the position and side upon which the subject is cast.

The Anesthetic.—The anesthetic which has been most satisfactory in our experience is chloral hydrate. This is administered intravenously in a 7 per cent solution, because the amount required for complete anesthesia can be most accurately determined when this method of introduction is employed. Anesthesia is started in the standing position and completed in the recumbent attitude until all reflexes are abolished. This form and degree of anesthesia will usually last for about an hour. In case of struggling, chloroform should be held in readiness. This can be administered by giving directions to an attendant. When the animal is completely anesthetized, the fore and hind legs are tied in a natural position to any available fixed structure, as a cramped position of the animal is a great hindrance to an operation. Immediately following, the hands and arms of the operator should be prepared.

Hands, Arms, Incision.—The types of cases presented to the general practitioner are constantly contaminating the hands so that they are actually teeming with virulent germs. When one considers the daily routine of handling retained placentae, infected wounds, abscesses, etc., it is quite obvious that any amount of scrubbing and antisepsis will fail to render the arms and hands surgically clean. Therefore, finger nails should be trimmed short and cleaned; the arms and hands scrubbed in soap and warm water with a hand brush. Considerable time should be spent in this procedure, which is followed by submerging the hands in alcohol 70 per cent. The use of rubber gloves and armlets is imperative, for they undoubtedly afford the best means of preventing contact infection. Dry sterilization of rubber gloves is preferred and they should always be cuffed. The manner in which rubber gloves have been used by many veterinarians is nothing short of burlesque. Some will don a pair of gloves and handle everything in the operating room before operating. The slightest slip in asepsis is no asepsis. The use of rubber armlets is just as essential because of the great depth the arm may have to be inserted into the abdominal cavity. After gowns and gloves are donned, tincture of merthiolate or tincture of iodine is applied to the surgical field. A shroud with a window is placed over the area through which the operation is performed.

Due to the known infection in the hair follicles, an incision is made through the skin only. The knife used is discarded. The incised skin edges are immediately covered with sterile towels, fixed with towel forceps, completely isolating the wound from skin contact. This is of utmost importance. It has been demonstrated that infection is most frequently brought about by contact, and rarely takes place from the air.

Two Methods

Operations in the flank may be performed by one of two methods. If the correction is simple and confined to the massage of an impaction, the abdominal muscles may be separated according to their direction. However, in any other operation the muscles should be liberally incised. A large incision will heal as quickly as a small one. Tissues are hopelessly traumatized and good surgery can not be accomplished if performed through peephole incisions. It is not the intent of this paper to deal with the surgical correction of pathological condi-

tions. Correction is the same regardless of the species. However, in equine surgery great care should be made to arrest hemorrhage. Cutting should not progress faster than the control of hemorrhage. Large bleeding vessels should be ligated with catgut. Hemostats may be applied to the smaller vessels. Capillary hemorrhage is to be controlled by sponging and pressure and, if necessary, by the use of adrenalin. Too much emphasis can not be placed on the control of hemorrhage. Uncontrolled bleeding, blood clots, and postoperative hemorrhage of wounds in the horse are secondary in importance only to that of infection. Slight hemorrhage may be neglected in other species but is disastrous in the horse. Uncontrolled hemorrhage leads to extensive edema, devitalization of tissues, skin cutting of sutures resulting from tension, infection, and necrosis.

Closure of the wound consists of suturing the peritoneum with No. 3-10 day chromic catgut. Each layer of muscle incised is approximated separately with No. 4-20 day chromic catgut. When the operation is performed in the median line, No. 24 Kangaroo tendon is used in the rectus, bringing the linea alba in apposition. This ensures greater strength because of the additional weight placed on the incision. The skin in all instances is sutured with No. 3 tension suture. Interrupted sutures are always the safest to use. In the bank a continuous interlocking suture (button hole suture) may be used as far as the lower two inches of the incision, with interrupted sutures being used for completion. Tension suture has been found to be the only satisfactory suture for the skin of the horse. Tension suture is strong, is nonirritating to tissues, resistant to tissue fluids, noncapillary, and ties into a firm knot.

PROTECTION OF THE WOUND

The wound is covered with collodion and a strip of gauze. When the animal rises, the wound is covered with a strip of sterile gauze that is supported by adhesive tape wrapped entirely around the body. Feed, particularly the bulky and gas-forming foods, is limited for a few days following the operation. If the intestinal tract is involved, feed is withheld for 3 to 5 days, in which case glucose solution is introduced intravenously and enemas are administered. Exercise should be limited. Temperatures should be observed daily. At first we followed the procedure of administering 125 cc. of neoprontosil with 400 gr. of sulfanilamide immediately following the operation. Sulfanilamide was continued for several days on the basis of 1 gr. per pound of body weight. We were inclined to give sulfanilamide credit for the good results. However, in recent cases, sulfanilamide has been withheld and recoveries were just as uneventful. Probably strict asepsis in combination with a good surgical risk is the answer.

RESULTS SUMMARIZED

We have performed 30 abdominal operations on horses within the last four years with a mortality of 26.67 per cent. Surgical interference was considered the only means of correction in all instances. All but 3 cases were acute ones. Of the latter, one was a cystocele, the second an abdominal tumor, both of which rendered the animal useless. The third was an intestinal anastomosis which was performed for experimental purposes. Since all others were acute, undoubtedly there would have been 100 per cent mortality without the intervention. Similar cases that were presented during this time are not included in this report because when first observed they were in the state of severe shock or were moribund. Therefore, an operation was not advised nor undertaken.

Operations successfully performed have ranged from laparotomies for breaking down impactions to the more complicated torsions of the intestine, torsions of the uterus, and cystocele. The cesarian section listed in the table should not have been attempted because a veterinarian had worked on this case for four hours before asking for assistance. Due to the edematous condition of the vulvar and vaginal mucosa considerable difficulty was experienced in examination, not to mention delivery of the foal. However, due to the

Abdominal Surgery in the Horse

Pathological Condition	Number of Cases	Recoveries	Deaths	Cause of Death	Remarks
Impaction	6	5	1	Fibrinous peritonitis	Destroyed 2 months later; inanition
Torsion of intestine	2	1	1	Gangrene of intestine, peritonitis	
Torsion of uterus	1	1	0		Foaled living foal 3 days later
Hernia, strangulated	3	2	1	Shock	
Hernia (foals); traumatic peritoneal rupture	10	7	2		1 outcome unknown
Mesenteric abscess	1	0	1	Hemorrhage and shock	
Intestinal anastomosis	1	1	0	Experimental	Abdominal pain when first watered and fed
Cesarian section	1	0	1	Septicemia and shock	Lived 24 hours
Cystocele	1	1	0		
Tumor fibroma	1	1	0		Skin infection
Prolapse intestine	3	2	1	Peritonitis; died 24 hrs.	Asepsis, antisepsis, and sulfanilamide
Total	30	21	8		
Percentage of total		70	26.67	3.33% unknown	

mare's apparently good condition an operation was performed, but she died 24 hours later. The cases reported as traumatic, peritoneal rupture, were in suckling foals which were originally scrotal hernias. One of these cases was removed from our observation and the outcome can not be reported. The mare suffering from torsion of the uterus was due to foal within a week of the time when she was first noticed to be ill. Torsion was to the left and approximately 360 degrees. Three days after the operation, this mare foaled normally, giving birth to a living foal. Both mare and foal progressed nicely.

An Experimental Anastomosis

To prove that abdominal surgery of a hazardous nature could be performed, we resorted to an intestinal anastomosis. This was experimental. The horse chosen was a gelding 20 years old, and in good flesh. There was no preliminary fasting. An end-to-end anastomosis of the jejunum was performed, removing approximately three feet of intestine. When given water to drink on the third day the animal showed slight abdominal pain. On the fifth day, a light feed of timothy hay and oats was allowed. Again he showed abdominal pain for a few hours. This was relieved with ¼ gr. of atropine. The wound healed by primary union and on the tenth day the subject was destroyed for dissection purposes. Healing of the intestine was perfect with no adhesions nor signs of peritonitis. A larger stricture than should be expected was present in the lumen but apparently did not interfere with movement of ingesta.

Discussion

Abdominal surgery in the horse should be approached from a practical and economic standpoint. The effort expended on this paper seems justified if for no other

purpose than to show that some of our older, fixed concepts must give way to newer methods, and to stimulate progress in other fields. Possibly, there has been no inducement to improve equine surgery, as there certainly has been little or no progress made in it for the last twenty years, because we have accepted certain ill-founded doctrines as facts. These doctrines were and still are facts if we continue to ignore the basic laws of bacteriology and asepsis, and do not take advantage of our improved knowledge in these lines. If progress is to be made, the practical association of laboratory with operative clinical experience must continue. Improved methods with better service to the client will drive out empiricism. Abdominal surgery can be performed successfully in the horse. Whether it is practical or not, the answer is left with you the profession. Undoubtedly some of these statements may not be acceptable to everyone, but there has been expressed that which has been accomplished and has for so many years been thought to be impossible.

Rhexis of the Prepubian Tendon

J. E. WEINMAN, D.V.M.
Lincoln, Neb.

A GUERNSEY, 9 years old, dull and listless for two days, went down and was unwilling to rise when urged. The case seemed like one of preparturient collapse. Her ears

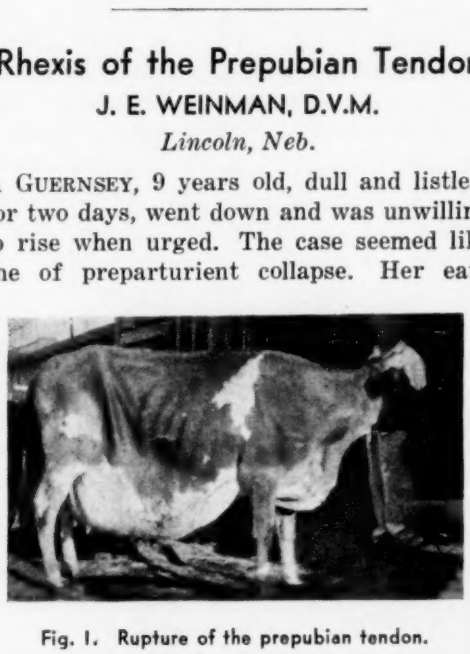


Fig. 1. Rupture of the prepubian tendon.

were drooped, skin cold and clammy, conjunctiva anemic, temperature 100.2° F., and pulse 80 and small. Her urine was positive for acetonemia. The cervix was closed.

After being given stimulating treatment (camphorated oil, calcium-dextrose solution and nux vomica), she was brought to the standing position by urging and aid, whereupon she was found to be suffering from rupture of the prepubian tendon (fig. 1). The cow was left to await developments, as the owners, regardless of the unfavorable prognosis, hoped for a safe delivery and perhaps a profitable period of lactation.

Two days later, labor pains began, but upon manual exploration the fetus could not be reached. By means of a canvas belt and a block and tackle the fetus was brought up to the pelvic path and delivered by traction, after the fore limbs and head were snared with ropes. No great amount of traction was necessary, but the calf was dead.

Realizing the hopelessness of the case, the owner consented to the holding of an autopsy. The postmortem findings revealed extensive dissolution of the posterior abdominal aponeuroses. The rectus of both sides was detached from the pubis and was fissured along the linea alba almost to the umbilicus. The transverse and oblique muscles were detached well above the middle of the pubis laterally. The udder was pulled forward and detached and its blood vessels were stretched and collapsed. There was considerable hemorrhage from rupture of the smaller vessels. The rumen was roted to the right and the spleen adhered to the floor of the abdomen.

Reptiles Anesthetized by Chilling

Poisonous snakes artificially refrigerated to stated temperatures can be handled without danger, according to a report credited to Curator R. L. Ditmars of the New York Zoölogical Park. With the temperature regulated at 38° F., 30 or more minutes is required to produce a sufficient degree of stupefaction. Dr. Ditmars is working out a table showing the time required to bring about the desired results in the various snakes. Snakes thus subdued return to normal in an hour or so after being returned to the warmth of their cages.

EDITORIAL

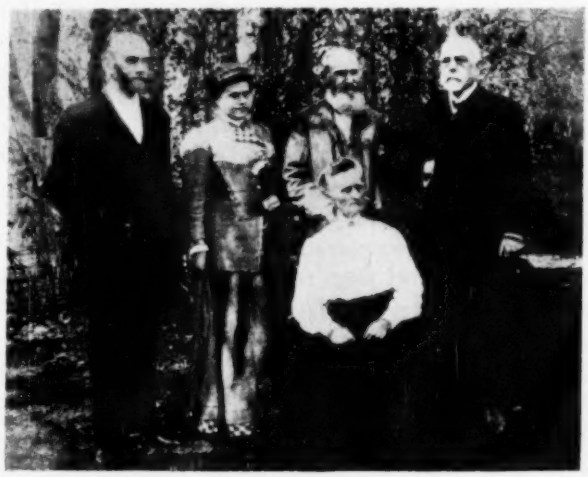
"Man's Greatest Victory Over Tuberculosis"*

SEVERAL BOOKS published in recent years have extolled the labors of veterinary science, but none has told a story as vivid as Professor Myers' book, "Man's Greatest Victory Over Tuberculosis." The victory alludes to the conquest of bovine tuberculosis in the United States.

1) To the discouraging events which led up to its beginning as a federal project in 1917 to the "cleaning up" of the last two counties of California in 1940.

2) To the early champions of the cause (D. E. Salmon, Leonard Pearson, V. A. Moore, Chas. E. Cotton, L. Van Es) and the repercussions they had to overcome.

3) To the triumvirate (Mohler, Kiernan, Wight) who carried the project to a glorious end by educating an uninformed public and by fair and firm determination to yield no ground to selfish opponents, or unscientific practices.



Reproduction of a photograph taken in the summer of 1908. Dr. Koch (extreme right) and his wife (standing) were making a trip around the world. They were on the way to the International Congress on Tuberculosis in Washington and stopped to visit Dr. Koch's brother, Henry, who lived on a farm near the village of Keystone, Iowa. Another brother, George, a grocer in St. Louis, came to Keystone for the reunion. Dr. Robert Koch finally agreed to have this picture taken, provided there were but three prints made, after which the negative was to be destroyed. (Reproduced through courtesy of Charles C. Thomas, publisher.)

This arbitrary division of the book (for reviewing purposes) does not tell the whole story in the order the author sets down. Bovine tuberculosis eradication as a pattern for the extermination of tuberculosis in man, the magnitude of the undertaking on a nationwide basis as a problem, and the scientific facts allied therewith, combine to make up a remarkable narrative of American history that not only reads like fiction but also adds pages to peacetime achievements that the world of science can forever applaud as an example of human wisdom and foresight. Dr. Myers' collection of data bearing upon bovine tuberculosis eradication in a country as vast and politically complex as ours truly confirms the adage that truth *is* stranger than fiction.

THE VETERINARIAN IN ACTION

No author could have chosen a better topic at this stage of the world's history nor interjected as much applied science, related biography and history as this story of a great achievement contains. It is first of all the story of the American veterinarian in action—on the field of battle against animal diseases—written by a prominent figure of the medical profession at the University of Minnesota where veterinary medicine has been rated at par value since the pioneer days of its evolution in the United States. One sees the verve of University Farm, of Charles E.

*A book review with personal interpolations by L. A. Merillat.

Cotton, of the late C. P. Fitch, of the great leaders of the United States Bureau of Animal Industry woven into prose. Obviously, a talented student of the great destroyer — tuberculosis — was watching theory translated into *fait accompli* as one state after another was pronounced free of bovine tuberculosis while the medical profession looked askance at the *modus operandi*. Bovine tuberculosis eradication was "an audacious undertaking," the author declares.

What does this book contain to justify this eulogium? The foreword by John R. Mohler, chief of the United States Bureau of Animal Industry for one score, forthwith reminds the world that the conquest of tuberculosis in cattle "established the supremacy of veterinary science over animal diseases," although in some circles the venture was regarded as a hopeless task. Confidence is not lacking in the American veterinary service. Its mastery over foot and mouth disease, contagious pleuropneumonia of cattle, tick fever and fowl pest, to choose a few examples, inspired that way of thinking. In 1920, when rinderpest broke out in Belgium and threatened the cattle herds of Europe, Dr. Mohler dared it to show its ugly face on this side of the Atlantic, as confidently as Babe Ruth stepped into the batter's box and told the southpaw to "fire away." Where "right is might," as in the eradication of animal diseases, there was never any lack of audacity among American veterinarians. Immodest as it seems, the evidence is the proof and, certainly, no one could accuse the veterinary profession of habitually indulging in the reverie of self-praise.

CATTLE THE CORE OF CIVILIZATION

Chapter I introduces cattle as the "core of civilization." The world has always lived from cattle: from the milk, meat, and hides they have produced all the way from the prehistoric tribes to the accession of the modern nations. These and a long list of human necessities are derived from this king of the farm and ranch. In the liberal arts, the list comprises billiard balls, hairpins, drum heads, drum snares, buttons, combs, tooth brushes, glue, soap, candles, shoes, harnesses, pocketbooks, handbags, coats and jackets, knife handles, tankage, fertilizer and bone meal, to name but a few.

In medicine, cattle furnish insulin and epinephrine; thyroid, pituitary, parathyroid, liver, and pineal extract; certain extractives of the reproductive glands; and smallpox vaccine. As producers of wealth, food and various commodities, cattle have stood at the top of human possessions since Genesis. With cattle, populations multiply; without them, they decline or perish.

The present inventory of American cattle is given as $2,259,793,000 and the industry yields an annual income of $4,000,000,000. The usefulness of cattle in terms of commodities and dollar values, plus the public health factor involved in the eating of meat, milk, cheese and butter, are the motives for the control of their diseases.

INFECTIOUS DISEASES OF ANIMALS

Chapter II describes briefly twelve important infectious diseases of animals, namely contagious pleuropneumonia, rinderpest, tick fever, foot and mouth disease, brucellosis, Malta fever of goats, anthrax, glanders, rabies, surra, tuberculosis, and encephalitis.

Bovine tuberculosis was mentioned by Keppler in 1648, by Florini in 1702 and by Dupuy in 1817. In 1831, Gurlt associated pulmonary tuberculosis of cattle with consumption of man. But it was Schuppel in 1872 who definitely established the identity of human and bovine tuberculosis. In 1894, James Law pointed out that tuberculosis affects numerous species of animals. The author emphasizes the large number of human lives tuberculosis has taken and the millions it has deformed.

"THE VETERINARIAN"

Chapter III is entitled "The Veterinarian." Here, the book outlines veterinary education as it evolved in this country and gives a brief summary of the American veterinary colleges since Dadd's Boston school of the 1850's down to the present educational system which is credited with

keeping step with the progress of medicine in compliance with the requirements of the Bureau of Animal Industry. Iowa State (1879) is rightfully credited with being the first one of the existing veterinary colleges to be founded.

Among the distinguished veterinarians of modern times, the author selects Andreas Christian Gerlach of Germany, George Flemming of England, Francis Hutyra of Hungary, Jean Chaveau and Henri Bouley of France, Bernhard Bang of Denmark, James Law and Veranus A. Moore of New York, Ernest C. Schroeder and Marion Dorset of the BAI, Karl Meyer of California, and Leunis Van Es of Nebraska. Some authors familiar with the veterinarians of Continental Europe would have included Nocard, Cadiot and Ramon of France, Deickerhoff of Germany and Perroncito of Italy.

The physicians named for having gained eminence through work in animal pathology are Theobald Smith, who grew to fame from his research work in the United States Bureau of Animal Industry, and M. P. Ravenel, nemesis of the great Koch in the heated controversy over the relation of bovine and human tuberculosis. Sir William Osler was once professor of physiology in the Montreal Veterinary College.

Humiliations of the Veterinarian

Chapter IV is entitled "Recognition and Sacrifices of the Veterinarian." In effect, it treats of the humiliation veterinarians have suffered [in the hands of politicians who always favored the industries and ignored the farming interests except at the moment of approaching elections]. The jeering of the Hon. Wm. H. Hatch of Missouri in the House of Representatives in the 1880's when he was striving to establish a competent veterinary service for the American people, conforming to contemporary knowledge of animal diseases, is pointed out.

[Congressman Hatch is the stalking shadow of this wonderful book or, perhaps, the book is the shadow of the great man who was not too political minded to consider the soil and its animals as the hope of mankind, the theme of President Byrd's address at the Washington session printed elsewhere in this issue which speaks of the farm and its animals as the source of a nation's wealth and security.]

Chapter V is a review of the accomplishments of the veterinary service—of its disease-fighting forces, its conquest of hog cholera, its work against brucellosis, and the drives against the foreign and domestic plagues that are ever ready to ravage the livestock industry. Credit is given to the research work that underlies these campaigns.

The Bureau of Animal Industry

Chapter VI is a 13-page history of the Bureau of Animal Industry, the main events leading up to its founding, such as the need of meat inspection, the abuse of animals on railways and the lack of attention paid to the millions invested in live stock.

The biographical sketches of its three chiefs—Salmon, Melvin and Mohler—contain information needed to round out a veterinary education in this country if not in the whole world, for in these biographies are found the ways and means of guarding and amplifying the animal population of an agricultural country. Quoting: "There is no branch of the United States government which is more important to the welfare of the nation than the Bureau of Animal Industry."

Quarantine Regulations and Meat Inspection

Chapters VII and VIII deal with the quarantine regulations which keep out of the country not only diseased animals but also the non-living carriers of infections of man and animals. The antemortem and postmortem meat inspection described needs no discussion for veterinary readers, except to agree with the author that federal meat inspection should not be restricted to interstate and export trade. But few states and municipalities have efficient meat inspection. "Even animals slaughtered on the farm for family consumption should be

inspected by a trained veterinarian," the author suggests.

TUBERCULOSIS OF CATTLE

Chapters IX to XVI treat of tuberculosis of cattle *per se*. These are 115 pages of up-to-date material on the tubercle bacillus, tuberculin and tuberculin tests, the bovovaccination of von Behring and BCG, immunity, treatment, prevention and physical and laboratory diagnoses. The futility of treating bovine tuberculosis is confirmed by quoting high authorities (Winchester, Niles, Van Es, Butler, W. J.). The cost of treatment and of vaccination exceeds the salvage.

THE BOVINE TYPE IN MAN

Chapter XVII, entitled "Bovine Type of Tuberculosis in Man," takes the reader through the controversial stage of this subject. Although hackneyed in our literature through the years, it is pleasant to contemplate that the national association (AVMA) in 1887 passed strong resolutions against the use of tuberculous cattle in milk and meat production. Moreover, it was largely the American veterinarians who disproved Koch's historic pronouncement (1901) that bovine tuberculosis is relatively harmless for man. The lowering of glandular tuberculosis in children where bovine tuberculosis has been eradicated is evident.

EUROPEAN AND AMERICAN METHODS

Chapters XVIII and XIX are 52 pages relating how the veterinarians of Europe and the United States protect man against the bovine type of the disease through the control of milk, milk products, meat and meat products. The obstacles that have been thrown in the way of such preventive measures as tuberculin testing, pasteurization, condemning parts of carcasses, and the microscopic examinations of milk, butter and cheese, apply to many countries. The compromising European methods for each country are described.

The famous Bang plan of isolating reactors announced in 1892 was discarded as impractical for nationwide eradication. It, however, refreshes the mind on the various attempts that have been made to master bovine tuberculosis.

EARLY AMERICAN ATTEMPTS

Chapter XX, on the "Early Attempts to Control Bovine Tuberculosis," reilluminates the forgotten past when the contagiousness of tuberculosis was still debated among pathologists and Koch had declared prematurely that his microbe was an innocent creature for man, when shining lights of our own profession were not in accord on the feasibility of control. Examples: Peter (New York, 1893), state veterinarian, insisted that a physical examination was sufficient. Trumbower (Illinois, 1894), state veterinarian, pronounced eradication an "endless task." Reynolds (Minnesota, 1909), prominent livestock sanitary officer, thought the cost would be too high and the task too difficult. *Breeders' Gazette* saw only a "shot-gun reception for the pole-axe inspectors and a state of anarchy." Talbot (Iowa, 1910), state veterinarian, wrote that there was still too much disagreement "among both the profession and breeders" and too limited funds to carry out testing and slaughter. V. A. Moore (New York, 1911), outstanding pathologist, pointed to the severe American method of testing and killing. Hart (California, 1916), teacher and pathologist, is quoted as having pronounced the laws and regulations too drastic.

Against these opinions were those of Winchester of Massachusetts, Pearson of Pennsylvania and Niles of Iowa, who believed in declaring war against the plague and fighting it at any cost. Salmon (1903) said wisely: "When public sentiment favors the eradication of tuberculosis in animals, the task will not be found an impossible one."

These were the conditions extant when Mohler and his lieutenant, Kiernan, launched bovine tuberculosis eradication in 1917. An encouragement was the success attained in the District of Columbia, where the percentage of infected cows was reduced from 18.7 in 1909 to 0.00 by 1925.

PLAN MADE POPULAR

Chapter XXI reviews the national and state laws making appropriations and regulations. Livestock societies were now urging a ceaseless campaign, reversing their previous attitude. The educational program was bringing results. Tuberculosis conferences, reports of tuberculosis committees of the AVMA and USLSSA, bulletins and circulars containing the scientific facts about tuberculosis and tuberculin, were important factors. Veterinary journals and associations expressed favorable views on the prospects of a successful end.

INTRODUCING KIERNAN AND WIGHT

Chapter XXII introduces John A. Kiernan and A. E. Wight, who directed the eradication. Little need be told about these men or their task. The work, as often told, was done so smoothly in our midst that it became a part of the veterinary aura. Occasional "wars" were but the expectation of a great romance.

The author devotes a few paragraphs to the "Opposition of the Medical Profession." Physicians unacquainted with the principles of livestock sanitation wanted the world to understand that there was a great difference between what they called "tuberculous infection" and tuberculosis. As we understand the allegation, the tiny tuberculous lesion the meat inspector finds in the center of a lymph node following a tuberculin test (a lesion hidden from the gaze of the physician) is "tuberculous infection" and the gross organic lesions shedding tubercle bacilli from every orifice are called tuberculosis by certain physicians. As late as 1934, an internationally known pathologist ridiculed the slaughtering of animals with "very little tuberculosis." Right here stands the difference between knowledge based upon the millions and millions of autopsies held by veterinarians in the line of duty and that of the physician who thinks of a tuberculin reaction not accompanied by (*e.g.*) a positive sputum examination as "tuberculous infection," whatever that is. That learned doctor would take us back to the search for "open tuberculosis" but leaves us to wonder how he would go about cleaning up a herd of tuberculous cows on that basis. Myers chastises his colleagues for seriously entertaining such ideas. The veterinarian's success has rested upon finding the tiny lesion, not in diagnosing advanced cases. Other famous physicians, among them Charles H. Mayo, approved the doctrines of the veterinarians.

ECONOMICS

Chapter XXIII is a well-told story of the economy of bovine tuberculosis eradication. The summary sets the losses from tuberculous cattle at $30,000,000 annually as of 1921, or at $300,000,000 in one decade granted that the disease, unchecked, did not increase. The author estimates that the dairy farmers of the United States had gained $500,000,000 by 1930, through improved reproduction, the saving in feed, the protection of other farm animals, fewer condemnations by meat inspectors, and the inducement to breed animals of high quality.

OPPOSITION TO THE ERADICATION PROGRAM

Based upon misinformation and lack of information, the eradication of bovine tuberculosis with the aid of the tuberculin test in detecting the infected animals was bitterly fought by the cattle interests, but (quoting) "the veterinarians eradicated the disease in spite of backbiting." In one German city (Mannheim), the owners of cattle refused to sell to city butchers on the health basis. The cattle were slaughtered outside the city instead of sending them to the municipal abattoir. New England farmers scouted the importance of tuberculosis. A few veterinarians were corrupted. Agricultural papers insisted that cattle did not have tuberculosis and when Koch (1901), world authority on the disease, declared that cattle were in no worthwhile degree responsible for the human disease, his pronouncement was hailed with delight by the opposition. The *Breeders' Gazette*, onetime bible of the stockman, denounced the "squirt gun brigade" in the most vitriolic language its editor could generate.

The antagonism between dairy farmers

and health boards reached its peak in Illinois (1911), where a law was passed to prohibit any city, village or town to demand the tuberculin test as a local health measure. The Illinois law boldly declared federal statutes and regulations in this respect "to be void and of no effect." In Manitoba, the opposition circulated a pamphlet declaring the milk of tuberculin-tested cows "poison for the babies." In California, a veterinarian rated as a cattle specialist signed and circulated a pamphlet denouncing tuberculin as "factory-made, filthy, unsanitary extract and essence of germs and their filth."

"There is scarcely a subject related to agriculture and public health," said Pearson, "that occasioned as much bitter discussion." The cattle interests would have none of it and the veterinary profession stood firm, believing that the heated controversy could but lead to inquiry and to truth, and eventually to the harmony required to reach the objective.

To break down all of this opposition, court rulings had to be invoked in Pennsylvania, Minnesota, Ohio, South Dakota and Iowa. The strange "cattle testing war" of Iowa (1931) is described in detail from inception to end.

TUBERCULOSIS IN OTHER ANIMALS

Chapter XXV, an excellent survey of tuberculosis in farm animals other than cattle, poultry and wildlife, is brief but to the point. Here we are reminded that swine tuberculosis was known to the Chinese 2900 B.C., and in Europe [Near East] since 1500 B.C. It was, however, only since 1890 that there was general agreement as to its occurrence in hogs in this country. Salmon, Mohler and Washburn of the BAI established the facts we now know. The prevalence and importance of avian tuberculosis and its bearing upon tuberculin reactions in cattle and swine-meat inspection are discussed. The annual loss from avian tuberculosis in swine is set at $2,000,000.

The important finding of Fitch and his coworkers on the infectivity of eggs of tuberculous hens is briefly broached, along with the observations of Feldman, Van Es, Schalk, Rich and Kernkamp on various phases of the avian tuberculosis problem.

The paragraphs on the disease in dogs and other carnivora contain information for the small animal practitioner to heed.

LESSONS FOR PHYSICIANS

Chapter XXVI.—In this chapter the author discusses matters the veterinary writer could not approach without seeming to encroach upon a branch of medicine in which he is not trained. "Veterinarians in Advance of Medical Profession" is one of the bold headlines. Various reasons for this paradox are given:

1) Veterinarians can study tuberculosis by sacrificing experimental animals and thus determine what occurs in different organs at stated moments.

2) Skeptics among physicians have regarded tuberculin reactions as "devoid of significance," while the veterinarian by searching for the lesions after making a tuberculin test confirms its diagnostic value.

3) While physicians are "quibbling over minutiae" the veterinarian convinces himself with "his own eye," not with arguments over the hidden interior of the human reactor. It was the "naked-eye postmortem demonstration" that made the veterinarians work as a harmonious unit.

4) Physicians are victims of fads running contrary to good health practices. The medical profession would be dubbed a gigantic trust were it to encroach upon personal liberty by attempting to control persons criminally spreading tuberculosis to their human associates. This, however, does not change the scientific facts.

Veterinary literature is where the physician must go for information on the diagnosis, contagiousness and ultimate eradication of tuberculosis. The tuberculous human and the tuberculous cow are analogous in these respects, yet the tuberculous man in the contagious stage spreads his infection unchecked from state to state, county to county, home to home. In cattle, the supervised importations and interstate shipments have had a telling effect in checking the disease. The upshot is that the

tuberculous human must be isolated before the utopian achievement of the veterinarians can be duplicated by the medical profession.

Bovine tuberculosis eradication cost $260,000,000. The medical profession spends that amount every four years mainly for the treatment of advanced cases—when it's too late. Closing, the author writes: "We, as physicians, can profit greatly by the numerous lessons taught us by the veterinarians. We need to accept the many facts they have established and abandon personal opinions and theoretical procedures which are now retarding progress in tuberculosis control in man."

Man's Greatest Victory Over Tuberculosis is a literary gem of an unusual sort—an historical, scientific, fascinating recount of an achievement that stands out in the world of science as a conquest without parallel. To the veterinarian, it is stirring; to the physician, it should arouse interest; to the stockman, it teaches a valuable lesson on the dynamics of science; and to the people, it brings out their obligations to the veterinary service, particularly to the federal and state veterinarians and the practitioners they employ.

From the paragraph on pleuropneumonia the wrong impression might be gained that the disease still exists in Continental Europe. In listing the years when foot and mouth disease broke out in the United States, 1924 is omitted, and in allotting credit for eradicating glanders in Canada, John G. Rutherford, instigator of the program, is not mentioned. The outbreak of rinderpest in Belgium following the World War (1920) and the eradication of that disease in the Philippines by American veterinarians would have fitted well into the text inasmuch as its horrors in other countries at remote periods are mentioned.

Professor Myers has given the veterinary profession a great book on a great subject, a volume containing a fund of grand material gathered from far and wide sources that will thrill veterinarians in all branches of the service and remind them that their sacrifices have not been in vain.

Glenn Ebright & Frank Tucker

WHEN THE PAPER of Glenn Ebright on feline medicine at the Washington meeting was signalized in *Time* and local newspapers as one of the features of the convention, a lesson was taught on the many undeveloped ramifications of veterinary medicine.

Glenn L. Ebright

Ebright's workshop is in Hammond, Ind., *banlieue* beyond the southeastern boundary of Chicago. Hammond is located along the chain of gigantic industries skirting Lake Michigan—among the smoking chimneys of blast furnaces, steel mills, oil refineries, and gargantuan factories of the big business class. Here, Ebright and his dad before him monopolized things veterinary since Hammond was a way station on the barren sand dunes of the region — about the last place on earth one would choose to develop a feline practice. Yet, seekers of advice and medical attention for ailing cats have beaten a path to Hammond, symbol (in the veterinary circle) of the fabulous home of better mouse traps. How come? The name Ebright was once famous in the art of subduing recalcitrant horses (bucking bronchos, balky horses, kicking mares) by kindness and strategy. Perhaps it was the fine art of handling animals in the right way that brought a large feline practice to Hammond.

Frank C. Tucker

Further downstate is Claypool, where Frank Tucker holds out. Although Claypool is not particularly famous as a poultry center, here there was developed a large poultry practice where folks go to get the last word on ailing fowls. In the census taken of the members of the Association to determine what they do, Tucker's practice ranks first in the percentage of income derived from poultry practice.

While richly deserved, this personal panegyric is not intended merely as a eulogy. The object is to show that veterinary practice is a wide-open field as fertile or barren as we make it.

Farm Surpluses and the Veterinary Profession

REGULATING agricultural production, which includes domestic animals, is one of the main problems confronting the people of all nations and, certainly, one that greatly concerns the veterinary profession.

On several occasions, not long ago, corn was cheaper than coal as fuel for the kitchen stove of the farm home, hogs left the farm at less than 2 cents a pound, horses and mules were unsalable at any price, cattle from the ranges were not worth the freight to central markets, and veterinary practice dropped to such a low level that many practitioners were driven to other occupations to make a living.

It is, therefore, reasonable for a profession like ours to concern itself in the prevention of the unfortunate agricultural depressions which have come along from time to time through the overproduction of farm products. Though perhaps too long delayed, large-scale measures of prevention have not been lacking in recent years. The present FCA (Farm Credit Administration) under the name of FFB (Federal Farm Board), approved by President Hoover, June 15, 1929, provided for the appointment of a commission "to study and report on crops, supply and demand, new markets and means of lessening surpluses." The Hoover commission became the Farm Credit Administration (1933), consolidating all farm-relief measures, including the prevention of surpluses and soil conservation.

While methods of obtaining these results may be used as political fodder, the principle involved is sound and deserves the approbation of those who live as near the issue as we, for, after all, as populations increase, the use of the land—the only source of life—stands out *sans pareil* among problems of universal concern, and ours in particular.

Agriculture and National Defense

OCTOBER 7, prominent figures in various branches of agriculture discussed the effectiveness of granary loans, productive adjustments, marketing quotas and surplus disposal in storing up the income and preserving the producing efficiency of American agriculture. Corn, fruits, cotton, tobacco, and banking as it relates to the growing and marketing of these farm products, made up a radio program showing that farmers occupy the front line in national defense.

In short, convincing arguments were brought out to the effect that the winning nation is the one capable of feeding its population. This event of the radio and the address of Dr. Mohler at the Bicentennial Celebration of the founding of the University of Pennsylvania in September bring the public nearer to a more general realization of its debt to animal industry and farming, the enterprises to which the work of the veterinary service is dedicated.

In the report of the Bureau of Foreign and Domestic Commerce (dated July 15, 1940) on the subject of national defense information from the war and navy departments, articles required for the veterinary service and the inspection of perishable foodstuffs are found in the endless list of supplies needed in augmenting the military and naval forces. It is apparent from this list that the veterinary corps is in good hands and not being overlooked in the program of army expansion.

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*January 1, 1941, J. G. Hardenbergh assumes the office of executive secretary and will at that time replace L. A. Merillat as chairman of the committees on legislation and program. The latter becomes editor of publications.

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Mrs. Wm. H. Ivens, *Secretary-Treasurer*, Ardmore, Pa.

Scarcity of Horses and Mules

At the time of the Spanish-American War (1898-1899), the United States Army had but 12,622 horses and 13,158 mules (as of June 30, 1899) and the 7,283 of those animals purchased for that national emergency practically exhausted the surplus, according to an editorial in the *Journal of Comparative Medicine and Veterinary Archives* (xxi, May 1900, p. 283).

Although mechanical ordnance, mechanical farming and mechanical transport for the industries will enable the country to carry on better than before the days of the internal combustion engine, it is nevertheless apparent that the number of salable horses and mules at the present time has dropped below the range of safety should civil and military activities be stepped up to meet the requirements of a lasting war. One of the measures taken by Germany in preparing for the present conflict was the raising of more horses to fulfill the needs of its expanding military forces and farming.

Perhaps in the present obsession to expand production of mechanical implements of war, a little attention to the breeding of horses should not be overlooked.

WITH THE EDITORS

A Book Review in Editorial Raiment

IN THIS ISSUE, the editorial section contains a book review, "off limits" as the soldiers say. The object is not only to welcome a new honorary member into the inner circle of the Association, but more particularly to bring attention to a remarkable book written around the greatest medical undertaking of all times—the eradication of bovine tuberculosis from the United States. What this task, now complete for the coming era of supervision, means is well told in this volume. It has taught a lesson, as the author points out, that may revolutionize the strategy of the medical profession, which in dealing with tuberculosis is still debating over facts definitely established by the veterinarians engaged in this gigantic project.

An American Veterinary History

The appointment of history-minded Bert W. Bierer of Baltimore, Md., on the Committee on History, by President Wight, forecasts the coming of a new era in the Association's undertakings. Except for the excellent researches by J. P. Foster of Minneapolis on the veterinary personnel of this country in regard to the colleges at which they were graduated, this committee did not write much history into the archives of the profession. Although the obvious intention was the writing of a book comparable with those of various countries of Europe, the task never took form.

In the absence of a definite policy set down by the membership, very little information that could be brought between covers was ever gathered until Bierer, as a hobby, published the five multigrams which now become available as a nucleus.

The School of Veterinary Medicine, University of Pennsylvania; the Division of Veterinary Medicine, Iowa State College; the Eastern Iowa Veterinary Medical Association; short journal articles by Huidekoper, Arburua and others; the more pretentious *Veterinary Military History of the United States* and the two histories of the United States Bureau of Animal Industry are other nuclei to draw from in the writing of a chronology of American veterinary events. None of these was intended as a general history of the veterinary profession in this country. They were intended to serve a special purpose. For example, *Veterinary Military History of the United States* was a bold attempt to place permanently on record the work of the veterinary profession in a great war; *History of the United States Bureau of Animal Industry* told the story of a great governmental bureau. The other documentations, valuable and appreciated as they are, fall short of fulfilling the aims of the Association.

There is so much romance, achievement and interesting biography to write into a history of the veterinary service of our country that from the Committee on History, maintained through the years to keep a big idea alive, there is hope that an "American Veterinary History" of universal popularity will emerge.

Much of the difficulty veterinarians meet is hard to overcome because the events of the past are not taken into account. Only a carefully compiled history can provide the means of placing veterinary science where it properly belongs in the affairs of our country.

Attention is invited to the new section, "Readers Say," where numerous letters of general interest may be published to mutual advantage. The introductory remarks heading this new venture explain the type of material the section is intended to include. Here's a chance to say what you think, in any kind of language not barred from the mails.

READERS SAY

EDITOR'S NOTE: ***Readers Say*** **makes its first appearance with this issue. Its purpose is to present, uncensored by the editorial room, experiences and opinions that bear constructively on the Association's activities, or on the veterinary profession as a whole. ¶Did you read a JOURNAL article and profit unusually from it? Are you out of accord with a current trend in the profession? Do you have authentic information about influences operating against the interests of veterinary science? Do you have a suggestion for improving the Association's service to its members? If you have something to say in these respects, by all means jot it down and mail it in—stating if you wish your full name, or just your initials, to be used. ¶Whether or not this department will become a permanent feature will depend upon the supply of suitable material received.**

Bang's Disease vs. Brucellosis—Argument 1

To the Editor: In an editorial on page 462 of the November 1940 issue, you state, "So, if 'Bang's disease' is replaced by 'brucellosis' in the JOURNAL, readers will understand that the change was not accidental." Also, on page 437 of the same issue, I note that in an article entitled "Far-Reaching Court Decision" you have referred to Bang's disease as brucellosis and included the following explanation: "(called Bang's disease in the court records)."

I question the wisdom of this change and want to point out that considerable effort has been expended on the part of the veterinary profession to educate farmers to the use of the term "Bang's disease." I also would like to point out that this is the legal nomenclature in many states and in the U. S. Bureau of Animal Industry. It would appear, therefore, that changing the name of this disease will result in considerable confusion.

Further, the change in name to brucellosis as proposed by you on the ground that Bang's disease is in the undesirable category of "personal names for diseases" is not consistent because the term "brucellosis" is derived from "Bruce"—discoverer of the causative organism.

I should like to point out that in the October 1929 issue of the JOURNAL, page 460, the following paragraph appears in the report of the Committee on Abortion which officially designates Bang's disease as the correct nomenclature: "The name of this disease be changed from 'bovine infectious abortion' to 'Bang's disease.' This association, in 1920, on the recommendation of its Committee on Abortion, adopted the nomenclature of 'bovine infectious abortion' to designate this infection. Nine years of further study has shown that there will be less confusion if the term 'Bang's disease' is used to designate the infection which is due to the organism commonly called *Bacterium* or *Brucella abortus.*"

Also, in the March 1931 issue of the JOURNAL, page 344, the following paragraph appears which made the term "Bang's disease" official for the United States Live Stock Sanitary Association: "In conclusion, it is recommended that the Association change the name of the Committee on Abortion to the 'Committee on Bang Disease' to harmonize with the terminology adopted by the American Veterinary Medical Association at its 1929 meeting."

C. R. DONHAM, *Indiana.*

Bang's Disease vs. Brucellosis—Argument 2

To the Editor: I have received a letter from C. R. Donham in which he enclosed a copy of the letter he sent to you regarding your proposal to change the name of Bang's disease to brucellosis.

I wish to go on record as being heartily in accord with Dr. Donham's criticism. Originally, the disease was known as contagious and infectious abortion, and created

no little amount of trouble because of the association of the act of abortion with the name of the disease. It was largely because of this fact that the name was changed to Bang's disease, and we have just about acquainted farmers and others who are interested in the disease with this change.

I see no particular advantage, at the present time, of dropping the name "Bang's disease" and trying to reëducate the public to the use of the term "brucellosis." As Dr. Donham aptly pointed out, it makes little difference, as far as concerns the use of the name of an individual in connection with the disease, whether that individual's name be Bruce, from which the term brucellosis was coined, or whether it be Professor Bang, for whom Bang's disease was named.

If we were at that stage in the proceedings where we were about to jump from contagious and infectious abortion to either Bang's disease or brucellosis, I believe that I would favor brucellosis. However, as poined out, since so much educational work has been done in obtaining the acceptance of Bang's disease, I believe that it would be an error to endeavor to change the name at this time.

R. A. HENDERSHOTT, *New Jersey.*

"Paying My Annual Dues Is a Pleasure"

To the Editor: Paying my annual dues is a pleasure that I've had for over 40 consecutive years. Membership in the Association has been profitable to me in practice as well as during my long service with the federal bureau of animal industry.

Belonging to the national association has given me a better understanding of my profession, its services and its ideals; and it has afforded me recognition and prestige in my contacts with other professions, business men and the general public.

In dealing with druggists I find that the mere showing of my membership card, even if I am in a strange city, enables me to obtain a discount without difficulty. Also, the AVMA automobile emblem gives my car a mark of distinction and aids me in locating it in large cities and parking lots. In one instance it saved me a trip to the police station.

E. M. NIGHBERT, *Florida.*

Science and Religion

To the Editor: Science has been called upon to renounce all belief in the existence of a personal God. This most recent pronouncement on atheism is said to have emanated from no less a personage than the great Albert Einstein, who not long since found it expedient to take refuge in a God-fearing country against the persecutions of an arrogant tyrant, and who has even accepted a means of livelihood at the hands of an institution of Christian origin. And now, from under the shelter of these benign influences, he hurls his invective against a belief in a personal God.

This is neither the time nor the place to drag out the trite theological arguments of religion for its God, nor to indulge in forensic debate on the merits of the question. Such arguments and debate would not only fail to convince the adversary, but might even serve to disaffect some as yet unspoiled by the taint of the reported Einsteinian doctrine.

This would, however, seem to be an opportune time to give voice to the convictions of the great mass of our profession, favorable to the existence of an all-wise, all-powerful Divine Personality. From the standpoint of veterinary science, nothing detracts from, but everything points to the fact of a Great Divine Intelligence. The writer can conceive of no conclusions of mathematics (the science of Einstein) which would be capable of any other construction. To be sure, God can not be demonstrated by logarithms, any more than He can be uncovered by the scalpel. But this has not deterred many great men of ours and other learned professions from accepting Him.

I was profoundly impressed by the spirit of reverence shown during the opening invocation at the AVMA convention in Washington. This recollection gives me heart

to reaffirm on behalf of thousands of American veterinarians a simple faith in a good and wise and all-powerful God, in utter rejection of the alleged Einstein hypothesis which denies the existence of a personal God.

Now, as never before, we need to cling to the Faith of our Fathers, and to say "Amen" to the prayer of Bard Kipling—

"Lord God of Hosts,
Be with us yet,
Lest we forget."

HUBERT BUNYEA, *Washington, D. C.*

Re: "Community Sales Cause Dissension"

To the Editor: I notice that in the November issue of the JOURNAL, page 463, the writer of the letter that prompted your editorial, "Community Sales Cause Dissension," failed to sign his name, or you failed to include his name.

Due to the fact that I have issued a quarantine against Mississippi cattle coming into the State of Tennessee, I naturally suppose that the writer intended a part of it for me, personally. I wish to inform you that the State of Tennessee tried in every way to coöperate with the community sales of Mississippi, but failed. Consequently, it became necessary for me to issue a quarantine on cattle coming into the state from Mississippi except those that were tested by accredited veterinarians, with the approval of the state veterinarian of Mississippi on the health certificate. This was imperative because we had confiscated health certificates that we knew were forgeries. We sent these certificates to the technician in Mississippi, who informed this office that it was not her signature on the abortion charts.

Despite the fact that we have taken every precaution and placed men on the Tennessee-Mississippi line to see that our livestock laws are obeyed, only last week we had to arrest four different parties for failure to comply with these laws.

I do not want the AVMA to become involved in any grievances that might exist between Tennessee and Mississippi, but I do feel that since you published this article you are entitled to an explanation of the situation.

A. C. TOPMILLER, *Tennessee.*

Surgery and Obstetrics

"Surgery and Obstetrics" appeals to the readers of the JOURNAL for material to keep it up to date. Illustrated copy is preferred, as no branch of medicine needs revealing illustration as much as surgery. The editors thank the Executive Board and House of Representatives for approving the addition of a Section on Surgery and Obstetrics to the Scientific Council of the Association. Such a section will furnish material for publication after the 1941 meeting. Meanwhile, to do justice to these significant branches of practice in large and small animals, there is nothing in sight except the miscellaneous articles coming out of the field. Although until now there has not been a shortage of material, there has been no attempt to cover the definitely important ground that will be cultivated by this section of the Association next year and thereafter through the planning of section officers devoted to the science and art of surgery and obstetrics.

When the Association was first divided into sections (1910), surgery was one of them. For the meeting of 1914 in New Orleans, which was never held, and for the one held at Oakland, Calif., in 1915, the section was merged with general practice, never to be reëstablished. The coming of the World War and the decline in horse usage were contributing factors in making the change. Since then, however, the tremendous development of small animal surgery on a high plane and the increase in the number and importance of a group of surgical operations in farm animals and recreational horses point to the JOURNAL'S obligation in this connection. The departure is an obligation because the salvage of property and the relief of pain and misery by surgery rank among the outstanding achievements of the veterinary service.

CURRENT LITERATURE

ABSTRACTS

Sodium Fluoride in Flea Control

Although the action of sodium fluoride on the body of the host is too slow for practical use as an insecticide, its larvicide properties are satisfactory. Mixed with inert material 1:9 and sprinkled over floors and swept into crevices at the rate of .06 oz. per square yard, it gives good results against *Ctenocephalides canis* and *C. Felis*. The author declares that even in weaker dilutions, sodium fluoride is useful in ridding homes, shops and factories of fleas. The price is low and its toxicity for man and animals is 30 times less than that of arsenites. [*E. Roubard. Emploi du fluorure de sodium dans la lutte contre les puces d'habitations. Bulletin de la Société de Pathologie exotique, xxxiii (1940), pp. 96-99.*]

The Veterinary Profession and Its Part in the Welfare of Live Stock

The theme, contexts and discussions of an address made by Professor T. Dalling of the University of Cambridge before a branch of the National Veterinary Medical Association of Great Britain and Ireland expose the unsatisfactory status of the veterinary set-up and show that public interest in the operations of veterinary science is yet to be aroused. The part control of animal diseases plays in national security has yet to lead to uniform understandings among the different divisions of the veterinary profession. Education, research, practice are not cemented into a harmonious whole.

Between the lines, one sees these branches going along more or less independent of one another regardless of the public benefit derived through the voluntary but unregulated coöperation upheld by members of the profession.

Veterinary medicine has been too exclusively devoted to disease, and too little attention has been given to the maintenance of health—preventive medicine. The narrow margin between health and disease as seen in such problems as reproductive disorders in domestic animals shows that curative and preventive veterinary medicine are dovetailed into each other inseparably.

On the practitioner's side, complaint is made that there is no way yet developed by which fees can be collected for merely giving advice. On this phase of the veterinary service as it affects the private practitioner, a member of the Society of Veterinary Practitioners said:

> Who will pay for it? There are men up and down the country who find it difficult to make both ends meet. . . . It is very well to talk about preventive medicine but when one is on the farm doing a job of work and in the course of the conversation one suggests something along the lines put forward by Professor Dalling, are we going to receive a fee for that? The answer is and will likely continue to be in the negative. If we are going to accept the tenets put forward, the State must contribute to the support of the veterinary surgeon.

Quoting a British farmer, the same speaker said:

> You veterinary surgeons in practice could be of great value to us engaged in agriculture if we could avail ourselves of the information the veterinary surgeon has.

Other speakers discussing the address spoke in the same vein. Veterinary service on the farms is germane to national welfare but the farmers are not able to support it by the fees they are able to pay for the treatment of the sick. The consensus was that practitioners are willing to do more for agriculture than agriculture is

prepared to do for them. [*T. Dalling, professor of biochemistry, University of Cambridge. The Veterinary Profession and Its Part in the Welfare of Livestock. The Veterinary Record, lii (Aug. 31, 1940), pp. 611-614.*]

BOOK NOTICES

Veterinary Bacteriology

The writing of this book by Merchant of Iowa State College signifies that interest in veterinary textbooks is reviving. Although written for the undergraduate, the treatise is a qualified *aide memoire* and reference book for graduates who follow the strides constantly being made in the cardinal branches of medical science.

Introductory chapters contain the usual approach to the general subject: biology of microbes, infections, resistance, immunity, anaphylaxis, laboratory methods, etc. It is a manual on bacteria, yeasts, moulds and viruses. Protozoölogy is intentionally omitted on the ground that it belongs in the field of parasitology. Bacteriophages, however, are included among the ultramicroscopic factors of infections.

The author invites attention to the newness of things bacteriologic. Bacteriology is but 60 years old. Studies have been focused largely upon the effect of bacteria rather than upon what they actually are in the chemical and physiological sense. Since the present definition of "bacteriology" ignores the etymon, the inclusion of organisms other than the Schizomycetes that cause disease in books of that title is justified by simply regarding the word as being synonymous with "microbiology." All of the authors of bacteriology have to make that apology because medical bacteriologists had the best story to dramatize and took the front of the stage. The author, however, reminds the reader of the other branches of this science (agricultural, industrial, dairy, sanitary, etc.) which are little thought of in medicine.

The history of medical bacteriology in the first chapter is a captivating brief on the evolution of medicine through the centuries which led to the germ pathology of this hour. The review of these theories (thuergic, humoral, miasmatic, microbic) under which medicine has labored since the Greek philosophers, tells a clear story in a few words of the rough and rugged road the practice of medicine has traveled to reach the goal line of 1940. It seems apropos to state here that to understand modern medicine one ought to know its historical background. No book on veterinary bacteriology contains as much information on history as the author puts into this text for his students and colleagues. It has the charm of coherent brevity and exactitude and of facts not too generally used in laying the foundation for a veterinary-medical education. The diversion is complimentary. Cold scientific facts without a bit of romance send the best classics to oblivion while the human factor leading up to them makes precious companions in the library.

The chapters on classifying, naming and describing the more common organisms of interest in animal medicine are compilations of known facts brought up to date. If the context of most of these subjects is short, the ground covered is ample for ordinary purposes. Space is not spared, however, where detail is imperative. Salmonella, a genus of outstanding interest at the present time, for example, gets 20 pages. The chapter on viruses, 48 pages, seems short in view of the present interest and rapid developments in that part of microbiology. Yet, the author succeeds in introducing each subject without notable omission of known facts.

Throughout is a good bibliography to guide the reader to more detailed information. A careful analysis of these references, old and new, foreign and domestic, shows that great pains were taken in gathering data and allocating credits.

The selection of titles, literary values, typography, illustrations, paper and binding is excellent. [*Veterinary Bacteriology. By I. A. Merchant, D.V.M., Ph.D., C.P.H., associate professor of veterinary bacteriology and hygiene, Iowa State College. Iowa State College Press, Ames, 1940. 628 pages. $7.00.*]

How to Train Your Owner

A book few small animal practitioners will do without once they have seen a copy. For the table of the waiting room it has no peer. Without breaking down the wisdom it contains into details, one is already impressed with the hit this book will make among the staffs of canine hospitals where dogs are studied for what they are as well as for the diseases they have.

The book is by Sniejok, a 3-year-old Samoyede, personified in picture and prose by authors who know dogs. It is truly a fine departure in canine literature. Besides being amusing, it is utilitarian far beyond the Mother Goose type of nursery picture books. The children will seize its philosophy and the elders will learn a lot from the well-told story—a story on the canine-human relations which make the family dog either a pleasure or a nuisance about the house.

"Most owners learn slowly," Sniejok declares as the opening shot, so he sets out to do something about it. Although there are but a few breeds of dogs, the number of breeds of owners runs into the thousands. The job of teaching owners is, therefore, a complicated job. No two owners are alike, and moreover, dogs understand our language better than we understand theirs, Sniejok goes on to say. What this imaginary canine author evidently intended to say is that dog language can not be translated like Caesar or Voltaire into our own tongue without effort faithfully conceived and systematically carried out. On account of its finesse, dog language is sometimes so entirely overlooked that a dog like Sniejok is apt to give up in despair and become just another dog. So, it is no idle chore to choose an owner wisely—to "look 'em over carefully," as Sniejok warns the reader forthwith. In other words, show your teeth to a prospective owner you don't like or jump in delight when the right guy comes along.

How to Train Your Owner is 10″ x 7½″, that is, the pages are ten inches wide and seven and a half inches high, and the book opens flat on the table. It contains 70 almost full-page pictures. The reading material is but the captions of these illustrations. In short, it is a book of pictures and captions, mostly pictures, each of which tells its own part of the story. [*How to Train Your Owner. By "Sniejok," as told to and photographed by William and Neill Dingledine. The Macmillan Company, New York, 1940. 80 pages. 70 illustrations. Heavy bond paper, durable cloth binding. $1.75.*]

Anesthesia

The art and the science of general anesthesia were never as closely studied in veterinary medicine as they should have been. Obviously, the unpopularity, particularly since local, infiltration and regional anesthesia came into use, has been due to some extent to lack of study of the reactions to inhaled anesthetics. A book, therefore, that brings together in a short text all of the known facts and plausible theories related to the subject makes interesting and profitable reading for those who practice surgery. *Anæsthesia*, just off the press, is a precious manual on the subject. In 16 well-illustrated chapters the author removes much of the bewilderment about anesthesia, its mode of action and its mediate and post-operative effects. It covers the use of chloroform, ether, nitrous oxide, ethyl chloride, and the nonvolatile drugs used for regional and spinal anesthesia.

Although written strictly for the human surgeon, the principles unfolded in each of the chapters are all applicable to the resort to these drugs and methods in animal surgery. To know just what is new in the much-debated subject of the mode of action of inhaled anesthetics is educational, for in this respect little of value has appeared in veterinary literature. As a matter of fact, in inhalation anesthesia, few would deny that we have not been blundering along unguided by either knowledge of the science or skill in the art. The chapters on post-anesthesia acidosis, operative and post-operative shock and on premedication contain knowledge the animal surgeon has been overlooking to his sorrow.

While we are little concerned with spinal anesthesia, other than in our crude extradural injections in the caudal region, the

chapter on that subject will fascinate any one at all interested in the practice of medicine.

The book is full of well-selected truths, free of guess work and exaggeration, and it is written by an author capable of telling what his wide experience as an instructor of anesthetists and as an anesthetist has taught him. [*Anæsthesia. By M. D. Nosworthy, M.A., M.D., B.Ch., anesthetist to Westminister Hospital, anesthetist for Grosvenor Hospital for Women, late senior resident anesthetist, St. Thomas Hospital. Chemical Publishing Company, Inc., New York, 1940. 223 pages. 35 illustrations. $4.25.*]

Practical Zoölogy

Arm-chair philosophy would have kept a science as intricate as zoölogy in the background but for the use of dissection, the craft that began to expose the form and structure of the living being during the medieval period, and without which biology and medicine could not have advanced. Every branch of science has certain phases that are difficult to teach and are therefore neglected. Zoölogy is such a branch, yet, unless the student is preparing for a career in the biological sciences, only a generalized knowledge of zoölogy is required to round out an education. Not so, however, for those who intend to study medicine. Here, the student should possess a sufficient knowledge of zoölogy before he is qualified to carry out even an elementary investigation.

Practical Zoölogy is a book on the dissection and preparation of the elementary types of animals (Protozoa, Nematoda, Lumbricus, etc., etc.), on the methods of preservation of materials for dissection and the making of permanent mounts for microscopic examinations. For delicate work special technic is described.

The author does not regard the cutting of specimens with the microtome as an elementary technic. In the study of animal morphology it is of fundamental importance. One can not muddle through the cutting of specimens and get good results. Sections that are not less than 200μ are useless for animal tissues as they have a denser structure and smaller cells than plants. [*Practical Zoölogy. By H. R. Hewer, A.R.C.S., D.I.C., M.Sc., F.L.S., lecturer in zoölogy at the Imperial College of Science and Technology. Chemical Publishing Company, New York, 1940. 118 pages, 8" x 5". $2.00.*]

MAN'S GREATEST VICTORY OVER TUBERCULOSIS. [See review on page 613.] *By J. Arthur Myers, Ph.D., M.D., F.A.C.P., professor of medicine and preventive medicine and public health, University of Minnesota. Charles C. Thomas, Springfield, Ill., 1940. 421 pages, 31 illustrations. $5.00.*

Brucellosis in School Children: A Lesson on Medicine

An endemic of undulant fever in a school of 400 boys is reported in *The Veterinary Record* (Aug. 10, 1940) in the form of an abstract from the *British Medical Journal* (March 23, 1940). The source of the infection was raw milk from a dairy herd found to be infected with brucellosis. The morbidity comprised two clinical, numerous subclinical, and 30 per cent latent cases. The latter figure is probably too high as reactions of 1:20 to 1:1,100 were counted. No further trouble was encountered after the milk was pasteurized.

Although this affair is not unique, it does carry a conviction—the conviction uppermost in the mind of our profession. For, here is a disease of animals that not only interrupts reproduction of a main source of human food but also concurrently infects the human being. Brucellosis in man and its allies in almost all animals from which food is derived is the two-edged sword the veterinary service is here to parry. Unchecked, in domestic animals, brucellosis could make a can of milk, a quarter of beef, a loin of pork or a saddle of lamb a luxury and at the same time inject a deadly germ into the undernourished victim of its pathogenic power.

THE NEWS

Student Enrollment for the Academic Year 1940-41

School	Fresh.	Soph.	Jun.	Sen.	Spec.*	Grad.	Total	1939-40	Change
Alabama Polytechnic Institute	60	71	54	52	2	0	239	259	—20
Colorado State College	43	37	43	35	0	0	158	152	+ 6
Cornell University	43	38	43	38	0	0	162	181	—19
Iowa State College	67	60	57	61	0	0	245	252	— 7
Kansas State College	59	51	55	61	0	0	226	230	— 4
Michigan State College	64	55	65	54	1	0	239	238	+ 1
Montreal, University of	4	11	11	12	0	0	38	50	—12
Ohio State University	67	68	53	54	0	0	242	230	+12
Ontario Veterinary College	13	75	64	59	0	0	211	247	—36
Pennsylvania, University of	52	46	41	45	7	0	191	188	+ 3
Texas A. & M. College	102	87	52	71	2	1	315	296	+19
Washington, State College of	39	39	40	43	0	0	161	149	+12
Totals (1940-41)	613	638	578	585	12	1	2,427	2,472	—45
Totals (1939-40)	670	635	579	525	29	34	2,472	2,386†	+86

*Figures do not include pre-veterinary students.
†Total number of students for 1938-39.

A study of the above table shows that the enrollment in the twelve recognized veterinary colleges is smaller by 45 than in the preceding academic year. It will be noted, however, that whereas in 1939-40 there were 63 special and graduate students enrolled, there are but 13 recorded in the present tabulation—a difference of 50. This may be due to the fact that some of the colleges did not report figures for students in these classifications.

In the table below, the regular enrollment (freshmen, sophomores, juniors and seniors) for the decade 1931-32 to 1940-41 is given. Here it will be observed that the present enrollment is larger by 5 than that of the preceding college year. Furthermore, the regular-student figure for 1940-41 is the largest in the history of North American veterinary colleges.

Enrollment of Regular Students for the Ten-Year Period 1931-32 to 1940-41

Academic Year	Enrollment
1931-32	1,378
1932-33	1,401
1933-34	1,370
1934-35	1,568
1935-36	1,810
1936-37	1,927
1937-38	2,170
1938-39	2,339
1939-40	2,409
1940-41	2,414

AVMA ACTIVITIES

Merillat to Attend California and Intermountain Meetings

Executive Secretary Merillat will attend the California conference at Davis, January 6-8, and the annual meeting of the Intermountain Livestock Sanitary Association in Salt Lake City, January 13-15.

Axby Elected to Executive Board; Wight Names Laitinen to District 9

J. L. Axby, state veterinarian of Indiana, was the successful candidate in the recent Executive Board election for District 3 (Illinois, Indiana, Wisconsin).

President Wight has named Edwin Laitinen (Ont. '16) of West Hartford, Conn., as member of the Executive Board for District 9 (Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont) to fill out the unexpired term (1942) of H. W. Jakeman, who became an *ex-officio* member of the Board by virtue of his election as president-elect of the Association.

APPLICATIONS

First Listing*

ANDERSON, JOHN H. A.
Monticello, Ind.
D.V.M., Terre Haute Veterinary College, 1913.
Vouchers: Chas. W. Fisher and Egbert S. Hess.

BOOTH, FRANK R.
Elkhart, Ind.
D.V.M., Michigan State College, 1932.
Vouchers: Walter K. York and Chas. W. Fisher.

CARSON, O. A.
Royal Center, Ind.
V.S., Indiana Veterinary College, 1899.
Vouchers: Chas. W. Fisher and S. F. Gaynor.

GOOTEE, LEO M.
Loogootee, Ind.
D.V.M., Indiana Veterinary College, 1913.
Vouchers: Harvey F. Page and Chas. W. Fisher.

HODSON, C. P.
304 W. 12th St., Peru, Ind.
D.V.M., Iowa State College, 1932.
Vouchers: Chas. W. Fisher and Harvey F. Page.

HORN, WM. R.
Topeka, Ind.
D.V.M., Grand Rapids Veterinary College, 1917.
Vouchers: Chas. W. Fisher and Harvey F. Page.

HUBER, C. W.
515 W. Culbertson St., Fostoria, Ohio.
D.V.M., Michigan State College, 1932.
Vouchers: O. B. Hess and H. D. Sheeran.

JOHNSON, J. E.
36 Erb St. E., Waterloo, Ont.
B.V.Sc., Ontario Veterinary College, 1919.
Vouchers: W. J. Rumney and H. S. MacDonald.

KLINE, E. W.
Thorntown, Ind.
D.V.M., Indiana Veterinary College, 1913.
Vouchers: Chas. W. Fisher and Frank H. Brown.

LAGARDE, R.
26 St. No. 359, Vedado, Havana, Cuba.
D.V.M., Havana University, 1921.
Vouchers: F. Santa Maria and C. P. Zepp.

LEACH, DANIEL F.
W. Barnstable Rd., Osterville, Mass.
V.M.D., University of Pennsylvania, 1933.
Vouchers: J. R. Young and H. W. Jakeman.

MCPHAIL, JOSEPH N.
Morocco, Ind.
M.D.V., McKillip Veterinary College, 1908; V.S., Ontario Veterinary College, 1907.
Vouchers: Chas. W. Fisher and J. E. Tinder.

MERRITT, W. E.
1130 S. 19th St., Fort Dodge, Iowa.
D.V.M., Iowa State College, 1938.
Vouchers: J. C. Flynn and Abner H. Quin.

MUNSON, TODD O.
Angell Memorial Animal Hosp., 180 Longwood Ave., Boston, Mass.
V.M.D., University of Pennsylvania, 1931.
Vouchers: Gerry B. Schnelle and E. F. Schroeder.

MYERS, B. E.
R. 3, Washington, Ind.
D.V.M., Indiana Veterinary College, 1913.
Vouchers: Harvey F. Page and Chas. W. Fisher.

O'KEEFE, EDWARD
1635 N. Bond St., Saginaw, Mich.
D.V.M., Michigan State College, 1940.
Vouchers: C. F. Clark and B. J. Killham.

PAGE, E. R.
Corydon, Ind.
D.V.M., Indiana Veterinary College, 1920.
Vouchers: Harvey F. Page and Chas. W. Fisher.

PRINGLE, E. G.
Goshen, Ind.
D.V.M., Michigan State College, 1932.
Vouchers: Chas. W. Fisher and F. C. Tucker.

SEEGER, M. M.
Thorntown, Ind.
D.V.M., Indiana Veterinary College, 1916.
Vouchers: Chas. W. Fisher and Frank H. Brown.

SMITH, R. L.
Kentland, Ind.
D.V.M., Indiana Veterinary College, 1917.
Vouchers: Chas. W. Fisher and Harvey F. Page.

SMITH, RAY F.
Boswell, Ind.
D.V.M., Chicago Veterinary College, 1917.
Vouchers: Chas. W. Fisher and J. E. Tinder.

SPIVEY, A. C.
Thorntown, Ind.
D.V.M., Indiana Veterinary College, 1912.
Vouchers: Harvey F. Page and Chas. W. Fisher.

WALKEY, FRED L.
459 Littleton St., West Lafayette, Ind.
D.V.M., Iowa State College, 1912.
Vouchers: Chas. W. Fisher and A. E. Wight.

*See July 1940 issue, p. 73.

WEAVER, H. J.
Hagerstown, Ind.
D.V.M., Indiana Veterinary College, 1917.
Vouchers: Chas. W. Fisher and A. E. Wight.

WOOLDRIDGE, E.
Momence, Ill.
B.V.Sc., Ontario Veterinary College, 1914.
Vouchers: Chas. W. Fisher and Charles C. Dobson.

YOCOM, E. J.
Winamac, Ind.
D.V.M., Indiana Veterinary College, 1910.
Vouchers: Chas. W. Fisher and L. A. Merillat.

Second Listing

Alter, Wayne, St. Paul, Ind.

Ballantyne, John Huber, 366 Keele St., Toronto, Ont.

Brown, Earl Frederick, Manilla, Ind.

Clore, Earl E., Greenwood, Ind.

Dohm, William H., Roslyn, L. I., N. Y.

Finch, Clyde F., Star Route, New Albany, Ind.

Foust, J. W., Hope, Ind.

Isenberg, C. G., 1201 N. Youngs Blvd., Oklahoma City, Okla.

Lett, William S., 414 W. Cherry St., Scottsburg, Ind.

Melton, John F., 3717 Hamilton Ave., Dallas, Texas.

Miller, Raleigh A., 2120 N. E. St., Richmond, Ind.

Murray, Chas., Seymour, Ind.

Noah, R. F., P. O. Box 872, Riverton, Wyo.

O'Connor, William Peter, 366 Keele St., Toronto, Ont.

Palmer, Walter J., 333 N. Audubon Rd., Indianapolis, Ind.

Paulish, Wm. F., Franklin, Ind.

Pittinger, Wm. T., 7655 Dix Ave. at Central, Detroit, Mich.

Robertson, Helen Mary, Coventry Farm, Princeton, N. J.

Roth, Gustav F., Crown Point, Ind.

Shaver, Leon E., Box 73, Brownstown, Ind.

Steinmetz, R., Southport, Ind.

Talbert, Mellis Grant, 250 E. Madison, Franklin, Ind.

Todd, Lewis K., Rt. 2, Box 3, Tacoma, Wash.

Tucker, Wellbourne S., Waldron, Ind.

Turner, Delver O., 200 N. Home Ave., Franklin, Ind.

Wiest, M. A., Botkins, Ohio.

U. S. GOVERNMENT

Selective Service Questionnaire

Page 7 of the questionnaire to be filled out by draft registrants contains a section of interest to veterinary students. After naming the college or university, length of course, hours of study and end of academic year, the registrant may or may not request that, if selected for training and service, his induction be postponed until the end of the academic year.

On page 8 the document instructs the registrant to make a written statement specifying the class in which he thinks he should be placed. Class II are those whose induction is deferred "because of the importance to the Nation of the service they are rendering in their civilian activities."

1939 Production of Drugs and Medicines for Animals Valued at $21,000,000

A preliminary report on the drugs and medicines produced in the United States last year, issued by the Bureau of the Census, reveals that those drugs and medicines made specifically for use on animals, including poultry, had a factory value of $21,785,793. Of this amount approximately $12,340,602 was in antitoxins, bacterins, serums, vaccines, viruses and similar biological products, and $9,445,191 in prepared remedies.

Over one third of the total value placed on these products was in serums. Serums produced in 1939 for use on animals were reported as having a factory value of $7,832,942.

There were 1,094 plants whose principal products during 1939 were drugs and medicines for all uses, the report shows. These plants turned out $364,985,404 worth of products during the year, according to the figures turned in to the Bureau. This was 3.1 per cent more than the total turned out by 1,034 establishments listed in this industry two years before. The establishments operating in 1937 reported their total production as having a factory value of $353,853,522.

Continued Progress in Bovine Brucellosis Eradication

John R. Mohler, chief of the BAI, recently announced the practical eradication of bovine brucellosis in 48 additional counties. At the present time 346 counties located in 20 states are on the modified accredited list. The total number of cattle tested in the entire accredited area is 2,942,500. The 48 counties mentioned above are located in Alabama, Arkansas, Georgia, Idaho, Louisiana, Michigan, Minnesota, North Carolina, North Dakota, Oregon, Penn-

sylvania, Tennessee, Virginia, Washington, West Virginia and Wisconsin.

Bovine Tuberculosis Practically Eradicated from Nation, BAI Announces

November 8, 1940, the BAI announced the practical eradication of bovine tuberculosis from the United States. With the completion of the area-testing program in the last two counties, Kings and Merced, of the last state, California, the degree of infection in every county in every state has now been reduced to less than 0.5 per cent.

During the 23-year span of the eradication program, more than 232 million tests and retests were conducted, and approximately 4 million cattle were found to be tuberculous.

The development of the new tuberculin which is produced on a synthetic medium has played an important part, for with this improved diagnostic agent about 10 per cent more infected animals are detected than with the tuberculin formerly employed.

BAI Transfers

Abraham Barton from Richmond, Va., to San Juan, P. R., on tuberculosis eradication.

Salmar P. Bolstad from Omaha, Neb., to Denver, Colo., on meat inspection.

Zackie H. Bridges from Richmond, Va., to Jacksonville, Fla., on Bang's disease.

David H. Carter from Montgomery, Ala., to Jackson, Miss., on tuberculosis eradication.

Bert L. Dawson from Los Angeles, Calif., to South St. Joseph, Mo., on meat inspection.

Clyde E. Deal from Montgomery, Ala., to Jackson, Miss., on tuberculosis eradication.

W. Douglas Dean from Montgomery, Ala., to Jackson, Miss., on tuberculosis eradication.

Wm. E. Dodsworth from Lincoln, Neb., to South St. Paul, Minn., on meat inspection.

Robert E. Dunn from South St. Paul, Minn., to Helena, Mont., on tuberculosis eradication.

Merle L. Farris from Nashville, Tenn., to Jackson, Miss., on Bang's disease.

Hunter E. Kendall from Columbia, S. Car., to Montgomery, Ala., on tuberculosis eradication.

James D. Leary from Lansing, Mich., to Madison, Wis., on tuberculosis eradication.

LeRoy Mims from Jackson, Miss., to Montgomery, Ala., on Bang's disease.

George H. Murphy from South St. Joseph, Mo., to Los Angeles, Calif., on meat inspection.

Robert J. Spain from Sacramento, Calif., to Salt Lake City, Utah, on tuberculosis eradication.

Ralph R. Springer from Jefferson, Mo., to Columbus, Ohio, on field inspection.

Oscar Sussman from Columbus, Ohio, to San Juan, P. R., on tuberculosis eradication.

Earl J. Wuellner from Lansing, Mich., to San Juan, P. R., on tuberculosis eradication.

Retirements.—Edgar P. Durham, Los Angeles, Calif.; Charles H. Hart, South St. Paul, Minn.; Lewis A. Licking, Wheeling, W. Va.

Regular Army

Captain Walter T. Carll is relieved from assignment and duty at Fort Riley, Kan., effective on or about November 15, 1940, and is assigned to the First Armored Division, Fort Knox, Ky.

Announcement is made of the promotion of 1st Lt. David S. Hasson to the grade of captain, with rank from October 24, 1940.

Major Ernest E. Hodgson is relieved from assignment and duty at Fort Logan, Colo., and from additional duty at headquarters, Southwestern Remount Area, Colorado Springs, Colo., effective on or about October 28, 1940, and is assigned to duty at the Southwestern Remount Area.

Captain Velmer W. McGinnis is relieved from his present assignment and duty at Fort Benning, Ga., effective on or about November 15, 1940, and is assigned to the Second Armored Division, Fort Benning, Ga.

Lt. Colonel Irby R. Pollard is relieved from assignment and duty at Fort Worth, Texas, effective on or about November 1, 1940, and is assigned to Headquarters, South Central Remount Area, San Angelo, Texas.

Lt. Colonel Stanley C. Smock is relieved from assignment and duty at Madison Barracks, N. Y., effective on or about November 4, 1940, and assigned to Fort Dis, N. J.

Captain Clarence L. Taylor is relieved from assignment and duty at Fort Myer, Va., effective on or about November 25, 1940, and is assigned to Selfridge Field, Mich.

Veterinary Corps Reserve

First Lieutenant Horace R. Collins, Jr., is relieved from assignment at Fort Worth, Texas, effective on or about November 1, 1940, and is assigned to headquarters, South Central Remount Area, San Angelo, Texas.

First Lieutenant Harry A. Gorman is relieved from assignment and duty at the Chicago Quartermaster Depot, Chicago, Ill., and is assigned to duty at the Boston Quartermaster Depot, Boston, Mass., effective on or about October 6, 1940.

The following veterinary reserve officers (all first lieutenants) were ordered to extended active duty by the War Department during the month of October and assigned to the stations indicated:

Robert J. Au, Seattle Quartermaster Depot, Seattle, Wash.

Geo. H. Brumble, Jr., Carlisle Barracks, Pa.

Fred M. Harris, Western Remount Area Headquarters, San Mateo, Calif.

Wilson M. Osteen, Fort Reno, Okla.

Hendrik Versluis, Army Medical Center, Washington, D. C.

Richard M. Zirkle, Fort Reno, Okla.

NEW ACCEPTANCES—FIRST LIEUTENANTS

Geo. Heath Brumble, Jr., 2937 Brock Rd., Richmond, Va.

Matthew J. Eggert, P. O. Box 1807, Roanoke Animal Hospital, Roanoke, Va.

Woodrow Wilson Matthews, 2011 Parker Ave., West Palm Beach, Fla.

Joseph Sieger Ruhe, 101 N. 6th St., Allentown, Pa.

Richard Max Zirkle, 1301 E. 2nd St., Defiance, Ohio.

Robert Otto Zimdahl, 2024 South St., Aubin, Sioux City, Iowa.

PROMOTIONS—TO CAPTAIN

Samuel E. Bunton, Jr., Box 695, Del Rio, Texas.

John Marshall Broadwell, Fort Bliss, Texas.

Harry Ruyle Lancaster, San Antonio General Depot, Fort Sam Houston, Texas.

Oliver Wilton Orson, Fort Bliss, Texas.

Harold M. Spangler, Fort Barrancas, Fla.

Carl Conrad Tucker, 311 W. Douglas St., Fort Wayne, Ind.

AMONG THE STATES

Arkansas

A conference on bovine brucellosis, a 7-state meeting, was held at Little Rock, October 28-29. The meeting was sponsored by C. D. Stubbs, state veterinarian, and A. W. Rice of the federal bureau of animal industry. On the program were Topmiller and Fry of Tennessee; Curry, Hughes and Biles of Missouri; Flower and MacDonald of Louisiana; Brashier and Robbins of Mississippi; Booth and Darby of Texas; Ricks and Fauk of Oklahoma; and Elmer Lash of the BAI. The problems from the breeders' point of view were presented by prominent stockmen.

A map showing that the state is one of the most progressive in the country was displayed.

California

Dourine, now a rare disease in the United States, was detected by A. S. Larsen, practitioner of Lompac, in several horses shipped from Arizona. An investigation of the source of the disease resulted in a ban against the shipment of horses from Arizona.

Canada

Notwithstanding the use of horses on a large scale by the Nazis in their devastating campaigns in Poland and France, the Canadian Department of National Defense has disbanded the Royal Canadian Army Veterinary Corps. The order affects 56 veterinary officers who will, no doubt, be absorbed by other units as yet not designated.

Colorado

The annual fall meeting of the Colorado Veterinary Medical Association was held at the Shirley-Savoy Hotel in Denver, October 25.

Guest Speaker Cornelius B. Philip of the U. S. Public Health Laboratory at Hamilton, Mont., gave an illustrated lecture on encephalomyelitis and its relationship to public health.

Officers elected for the coming year are R. F. Bourne of Fort Collins, president, and C. L. Davis of Denver, secretary-treasurer.

C. L. DAVIS, *Secretary.*

District of Columbia

A recent communication from A. Eichhorn of Beltsville, Md., listed the following participants in the alumni dinner of the New York City and American Veterinary colleges, held during the Washington session of the national association:

C. E. C. Atkens	John J. Hayes
W. J. Butler	Wm. H. Kelly
H. B. Cox	H. Koch
Mrs. H. B. Cox	J. Payne Lowe
W. H. Dodge	R. S. MacKellar
Adolph Eichhorn	Mrs. R. S. MacKellar
Charlotte Eichhorn	J. R. Porteus
J. William Fink	Arthur N. Smith
Warren J. Fretz	Mrs. Arthur W. Smith
Mrs. W. H. Harrison	Harry Ticehurst

• • •

The District of Columbia Veterinary Medical Association held a dinner-dance meeting, with 122 veterinarians and their wives in attendance, at the Mayflower Hotel in Washington, on the evening of November 5, Col. R. A. Kelser presiding.

Following the dinner there was a short business meeting and, afterward, a lecture illustrated by motion pictures of the Panama Canal was given by Col. Kelser. The remainder of the evening was devoted to dancing and listening to election returns.

W. M. MOHLER, *Secretary.*

Illinois

The 21st annual Illinois veterinary conference was held at the University of Illinois, Urbana, October 22-23, with President Wight of the national association as one of the principal speakers. (See page 559.)

The program included demonstrations of laboratory tests of interest to practitioners and a report of experimental work done by the Laboratory of Animal Pathology and Hygiene. B. W. Fairbanks of the University of Illinois spoke on "Newer Knowledge of Swine Nutrition." L. D. Frederick of Chicago gave a paper on "Hepatic Disorders of Cattle as Related to Feeding Practices." C. R. Donham of Purdue University, Lafayette, Ind., spoke on sterility in cattle, and swine erysipelas and infectious enteritis were discussed by Frank Breed of Lincoln, Neb., and others. A. F. Schalk of The Ohio State University, Columbus, Ohio, read a paper on "So-Called Protein Poisoning in Swine." Bang's disease and poultry diseases were among the other topics covered in the two-day program.

C. C. HASTINGS.

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Judging from the newspaper clippings received, Graham's plan of announcing one's absence from home to attend the University conference has "clicked" all over the state, not only in announcing that the doctor is going to be absent from home while attending a graduate course, but also in regard to the more important problems confronting the business of farming that veterinarians are striving to solve.

• • •

The 36th annual meeting of the Mississippi Valley Veterinary Medical Association was held on November 14 and 15 at Galesburg, Ill. Veterinarians from five states participated in the program. The speakers included L. D. Frederick of Chicago; Frank Breed of Lincoln, Neb.; W. R. Krill of Columbus, Ohio; John B. Bryant of Mt. Vernon, Iowa; A. C. Merrick of Brookfield; J. R. Christian of Woodhull; J. C. Carey of West Liberty, Iowa; E. T. Baker of Moscow, Idaho; and J. D. Reardon of Galesburg. The banquet was one of the best in the history of the association.

Officers elected for the ensuing year were: president, C. M. Rodgers of Avon; vice-president, W. O. Hilyard of Little York; and secretary-treasurer, L. A. Gray (reëlected) of Bushnell. J. C. Brown of Joy, R. M. Carter of Alexis, J. H. Krichel of Keokuk, and C. F. Pauly of Kirkwood were elected to the advisory board.

Iowa

Moranville's presidential address before the Eastern Iowa Veterinary Association, Inc., at Cedar Rapids, October 15-16, reviewed the situation confronting the practitioners of eastern Iowa in regard to the effect the free marketing of anti-hog-cholera serum and virus may have on the veterinarians and swine-breeding interests, hopeful, however, that sales by druggists and farmer organizations may not be as severe as expected. The activities of the Farm Bureau in this connection have caused considerable friction as some of the members have been hard hit by this remarkable departure. Legal action has begun against the plan of collective buying of this and other biological products. It's a risky way to build up membership in the Farm Bureau, President Moranville declared. Foresight should drive druggists and other tradesmen away from such a traffic. . . . The low incidence of encephalomyelitis last year and the higher incidence of hog cholera due to neglect in vaccinating, the advisability of immunizing horses against tetanus by the use of tetanus toxoid, the prospect of artificial insemination, the part veterinarians are playing in the control of bovine brucellosis, the introduction of phenothiazine into veterinary

SWINE CLINIC, UNIVERSITY OF ILLINOIS VETERINARY CONFERENCE, OCTOBER 22-23, 1940

Left to right: Fred Hecker, Cutter Laboratories; E. E. Kelsey, Eureka; H. R. Hester of the University of Illinois, demonstrating the lesions of swine erysipelas; L. T. McClure, Gurnee; C. A. Metz, Walnut; and H. N. Holmes, Mt. Sterling.

practice, and the increasing violations of the practice act were dwelt upon with impressive details.

EDITOR'S NOTE: A special report of the Eastern Iowa meeting will be published in the January issue.

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Eighty-three practitioners from Illinois, Iowa, Missouri, Kansas and Wisconsin registered for the annual clinic of the Midwest Small Animal Association, held at the Hotel Burlington, Burlington, November 8.

Miss Mildred Radakovitch, director of nursing at Simpson College, Indianola, spoke on sterilization technic for small animal practitioners. Secretary-Treasurer Wayne H. Riser of Des Moines demonstrated a cesarian section on a bitch well along in pregnancy from which twelve live pups were taken.

A. R. Theobald of Cincinnati demonstrated the removal and packing of anal sacs, removal of Harder's gland without removal of the membrana nictitans, sutureless oöphorectomy, reduction and bandaging of the coxofemoral luxation, and amputation of the first phalanx and toenail by disarticulation—all under absolute anesthesia. A. C. Merrick of Brookfield, Ill., demonstrated ear operations and a technic of blood transfusions. Drs. Theobald and Merrick also made diagnoses on subjects presented by the veterinarians in attendance.

At the evening session, a round-table discussion of small animal problems was conducted by Drs. Theobald and Merrick. President C. L. McGinnis of Peoria, Ill., and Secretary-Treasurer Riser led the discussions.

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C. D. Cady, Mason City practitioner, has filed suit for damages set at $50,000 against W. D. Kinney, retired physician and farmer, charging "slanderous statements" in connection with an outbreak of hog cholera. Dr. Cady's contention (*Mason City Globe Gazette*, Oct. 17) is that many of the hogs were in the last stages of cholera when he was called.

Kansas

"Hog cholera rages in N. E. Kansas," is a headline in the *Holton Recorder*. The outbreak is said to be the worst in 30 years for that region. Horton, Hiawatha and Everest are given as the centers of most of the trouble.

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The first annual meeting of the Missouri Valley Veterinary Association, which was to play an important rôle in building up the veterinary service of the Middlewest, was held at Fort Leavenworth in June 1895. The main subjects on the program were actinomycosis and epizoötic abortion.

Kentucky

An ordinance passed by the City of Glasgow requires that all members of medical professions must procure a state license before they will be allowed to practice in that municipality. Physicians, dentists, veterinarians, osteopaths, chiropractics, masseurs, dietitians, and nerve and muscle manipulators are named in the ordinance.

Louisiana

F. F. McNeeley (K.C.V.C. '17) was appointed assistant state veterinarian, effective October 1, replacing C. E. Page, who resigned.

Dr. McNeeley will have quarters in the office of State Veterinarian E. P. Flower at Baton Rouge, where he will be in intimate contact with all regulatory activities.

Manitoba

The Veterinary Association of Manitoba held a clinic at Brandon, August 10, in conjunction with the celebration of their 50th anniversary. About 50 veterinarians were in attendance, including nine from North Dakota. Harry Ross of Brandon and J. K. Morrow of Winnipeg were the chief clinicians.

A banquet at the Prince Edward Hotel concluded the meeting.

Minnesota

W. L. Boyd, chief of the veterinary department of the state university, Wm. Feldman of The Mayo Foundation, Carl Eklund, M.D., of the state department of health and R. L. Anderes of the Jensen-Salsbery Laboratories, Inc. Kansas City, Mo., were the principal speakers at the semiannual meeting of the Southwestern Minnesota Veterinary Medical Association held at Marshall, October 7.

Missouri

Thirty Kansas City firms have received contracts amounting to $3,000,000 for materials needed in building up the national defense. Among these (*Kansas City Times*, Oct. 26) is Jensen-Salsbery Laboratories, Inc., listed as having received a contract for veterinary supplies amounting to $5,000.

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The loss of more than 700 horses from encephalomyelitis in Saline and adjacent counties was reported late in October. The mortality was given as about 5 per cent of the horses affected.

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Health and thrift, the most important problem in the raising of live stock, was the theme of an address made before the Rolla Farmer's Exchange by Dr. Uren of the state university

faculty. He emphasized the fact that live stock is the farmer's main source of income.

Montana

In complimenting W. J. Butler, state veterinary surgeon, on having been appointed "chairman of a committee to draw plans for an ideal veterinary system," the *Havre News* says: "The Montana statutes and regulations for the livestock sanitary board were selected as outstanding and said to be models for the nation's livestock organizations."

New Jersey

Recent exports of animals from New Jersey included chickens, hogs and purebred cattle destined for Greenland. The latter formerly depended upon Denmark for sources of fresh milk and meat, but has turned to America because shipments from Denmark have been stopped. J. R. PORTEUS, *Resident Sec'y.*

New Mexico

Several thousand citizens of Albuquerque have petitioned the city council to pass a meat-inspection ordinance. The movement is sponsored by the state association.

North Dakota

The 33rd and 34th annual reports of the state livestock sanitary board to the governor of North Dakota have just been published.

The publication containing these reports is dedicated to John W. Robinson (Chi. '03) of Garrison, who has served on the board, with the exception of a brief period, since its establishment in 1907. A fine tribute to him for his many years of creditable service is written by Dr. Van Es.

The reports are well written and give a detailed account of the livestock disease-control work in the state for the period covered (1939-1940). That work is a credit to the executive officer, T. O. Brandenburg, and the board under which he serves—work in keeping with the traditional dignity of the board as established by the pioneers Van Es, Crewe and Robinson.

FREDERIK LOW, *Resident Sec'y.*

Ohio

For the inauguration of Howard Landis Bevis as the seventh president of The Ohio

PURDUE UNIVERSITY SHORT COURSE FOR VETERINARIANS

Among those participating in the clinics of the annual Purdue University short course for veterinarians, held at the University, Lafayette, Ind., October 16-18, were (front row, left to right) J. F. Bullard of Purdue University; C. W. Fisher of Royal Center, Ind.; W. R. Krill of Columbus, Ohio; H. C. H. Kernkamp of St. Paul, Minn.; E. S. Hess of Kentland, Ind.; D. D. Baker of Wabash, Ind.; and N. C. Wheeler of Purdue University. Back row, left to right: E. S. Weisner of East Lansing, Mich.; C. H. Smith of Crown Point, Ind.; C. C. Donelson of Indianapolis, Ind.; G. R. Fowler of Ames, Iowa; W. F. Smith of Valparaiso, Ind.; F. N. Andrews and F. L. Walkey of Purdue University; F. C. Tucker of Claypool, Ind.; and N. E. Weitkamp of Purdue University.

State University, on October 24-25, 1940, there gathered on the campus at Columbus, Ohio, the greatest array of scholars in the history of the University. More than 100 college and university presidents and several hundred more distinguished educators from all over the country were present. Among them were delegates from 33 societies and associations for the advancement of learning. A. J. DeFosset of Columbus, Ohio, was the delegate selected to represent the American Veterinary Medical Association.

The inauguration ceremony was unique in that it was made the basis of an educational forum; also, it was the first time in the 67-year history of the institution that a president was inducted into office with formality.

Among the prominent speakers on the forum were James Bryant Conant, president of Harvard University; Clarence A. Dykstra, president of the University of Wisconsin and chairman of the Draft Board; Morris Fishbein, editor of *The Journal of the American Medical Association;* Roscoe Pound, dean emeritus and professor, Harvard Law School; Walter C. Coffey, dean of the College of Agriculture, University of Minnesota; William Elgin Wickenden, president of the Case School of Applied Science; Ralph E. Flanders, member of the Business Advisory and Planning Council, U. S. Department of Commerce; and Aurelia H. Reinhardt, president of Mills College and president of the American Unitarian Association.

A colorful academic procession of more than 1,000 delegates to the inauguration was held. The educators, in robes and caps, marched four abreast through an aisle of honor formed by 400 University students, from the administration building to the men's gymnasium, where the ceremonies were held.

Final tribute was made to President and Mrs. Bevis at a formal dinner in the Neil House, a downtown hotel. More than 1,000 invited guests and delegates participated. Among the hosts and hostesses were genial Dr. and Mrs. Oscar V. Brumley, who presided at the table where Dr. and Mrs. DeFosset sat. Dr. Brumley, it will be remembered, is a former president of the American Veterinary Medical Association and the present dean of the College of Veterinary Medicine at The Ohio State University.

Among the principal speakers at the dinner were John J. Tigert, president of the University of Florida, and Edward C. Elliott, president of Purdue University.

A. J. DEFOSSET, *Reporter.*

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In the near future a vacancy is expected in the meat-inspection force of the Toledo Department of Health. The salary range is $2,100 to $2,580 per year. Inasmuch as there are no veterinarians in Toledo who are eligible for this position, applicants will not be required to be residents of the city.

Oklahoma

D. H. Ricks of the state department of agriculture drew attention in local newspapers to the poisonous character of second-growth cane for cattle, emphasizing the importance of first testing the cane for prussic acid by chemical analysis before turning herds into the cane field, or by turning a poor-grade animal into the field to determine if the cane is toxic.

• • •

An outbreak of equine encephalomyelitis swept through Okamulgee and Delaware counties in October, press reports state.

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Judges of the common pleas court of Tulsa decided that J. M. Higgins of that city is a doctor within the meaning of the law exempting doctors from jury service. The decision was based upon the definition of "physician" which, says the dictionary, is "one who practices the art of healing and dispensing medicines."

Pennsylvania

W. Graham Love (U.P. '33), who was associated with the Department of Pathology, School of Veterinary Medicine, University of Pennsylvania, for five years, resigned effective November 15 to take a post with the BAI laboratory at Beltsville, Md. A farewell dinner was given for Dr. Love by some of his intimate friends among the faculty and experimental staff on November 12 and, following, Epsilon chapter of Alpha Psi honored him at a party.

A. HENRY CRAIGE, JR., *Resident Sec'y.*

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Reichel Laboratories announce that they will engage in business under the direction of John Reichel (U.P. '06) relating to the preparation and distribution of medicinal products for professional use and will make available a consultant service with special reference to the control and preservation of such products. The laboratories are located at Kimberton, near Valley Forge.

Dr. Reichel was formerly director of the biological laboratories of the H. K. Mulford Company, from 1917 to 1929; director of the Mulford Biological Laboratories of Sharp & Dohme, Inc., from 1929 to 1936; and director of the technical division of Sharp & Dohme, Inc., from 1936 to 1940.

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The Northwestern Pennsylvania Veterinary Club held a luncheon meeting on October 8, at the Kepler Hotel, Meadville, Pa., with 16 members in attendance. Thomas W. Craver of Youngstown, Ohio, invited the club to meet at

his hospital for the next meeting, which will be held in January.

P. L. ROUSE.

Tennessee

According to State Veterinarian A. C. Topmiller, there were six outbreaks of blackleg in five counties of the state during October, two outbreaks of hemorrhagic septicemia in two counties, eight outbreaks of hog cholera in six counties and nine outbreaks of erysipelas in eight counties.

Texas

"Sleeping sickness moving south" is the headline in the *Wharton Spectator*, October 19. Twenty cases were reported in Brazos and nearby counties by A. A. Lenert of Texas A. & M. College.

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The Bexar County (San Antonio) Veterinary Medical Association is one of the live local associations of the country. It meets monthly. The president is W. E. Kern and the secretary-treasurer, A. E. Wharton.

Wisconsin

The Southwestern Wisconsin Veterinary Medical Association held a meeting at Darlington on October 17 during which dinner was served to about 50 veterinarians and their wives. Following the dinner, films of an educational nature were shown.

J. S. HEALY, *Resident Sec'y.*

COMING MEETINGS

American Veterinary College Deans. Palmer House, Chicago, Ill. December 3, 1940.

Small Animal Hospital Association. Los Angeles, Calif. December 3, 1940. W. K. Riddell, secretary, 3233 W. Florence Ave., Los Angeles, Calif.

New York City, Veterinary Medical Association of. Hotel New Yorker, New York, N. Y. December 4, 1940. J. J. Merenda, secretary, 136 W. 53rd St., New York, N. Y.

United States Live Stock Sanitary Association. Morrison Hotel, Chicago, Ill. December 4-6, 1940. Mark Welsh, secretary, College Park, Md.

Dallas-Fort Worth Veterinary Medical Society. Dallas, Texas. December 5, 1940. R. L. Rogers, Jr., secretary, Route 2, Gordon, Texas.

Houston Veterinary Association. Houston, Texas. December 5, 1940. W. T. Hufnall, secretary, 1612-14 E. Alabama Ave., Houston, Texas.

St. Louis District Veterinary Medical Association. 7800 Olive St. Rd., St. Louis, Mo. December 6, 1940. J. P. Torrey, secretary, 555 N. 14th St., East St. Louis, Ill.

Chicago Veterinary Medical Association. Hotel Sherman, Chicago, Ill. December 10, 1940. G. S. Elwood, secretary, 5449 Broadway, Chicago, Ill.

Southeastern Michigan Veterinary Medical Association. Medical Arts Bldg., 3919 John R St., Detroit, Mich. December 11, 1940. F. D. Egan, secretary, 17422 Woodward Ave., Detroit, Mich.

Western New York Veterinary Medical Association. Buffalo, N. Y. December 12, 1940. F. F. Fehr, secretary, 243 S. Elmwood Ave., Buffalo, N. Y.

South Dakota Veterinary Medical Association. Carpenter Hotel, Sioux Falls, S. Dak. December 12-13, 1940. G. E. Melody, secretary, Gettysburg, S. Dak.

Kansas City Veterinary Medical Association. Kansas City, Mo. December 16, 1940. S. J. Schilling, secretary, Box 167, Kansas City, Mo.

San Diego County Veterinary Medical Association. Zoölogical Research Bldg., Balboa Park, San Diego, Calif. December 16, 1940. Paul D. DeLay, secretary, State Poultry Pathological Laboratory, Balboa Park, San Diego, Calif.

Massachusetts Veterinary Association. Hotel Westminster, Boston, Mass. December 18, 1940. H. W. Jakeman, secretary, 44 Bromfield St., Boston, Mass.

Southern California Veterinary Medical Association. Chamber of Commerce Bldg., Los Angeles, Calif. December 18, 1940. Charles Eastman, secretary, 725 S. Vancouver Ave., Los Angeles, Calif.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa. December 26 (tentative), 1940. A. Henry Craige, Jr., secretary, University of Pennsylvania, Philadelphia, Pa.

Vermont Veterinary Medical Association. The Tavern, Montpelier, Vt., December 28, 1940. G. N. Welch, secretary, Northfield, Vt.

California Veterinary Conference (under joint sponsorship of California State Veterinary Medical Association and University of California). Davis, Calif. January 6-8, 1941. Further information may be secured from C. M. Haring, Division of Veterinary Science, University of California, Berkeley, Calif.

University of Pennsylvania Conference for Veterinarians. University of Pennsylvania, Philadelphia, Pa. January 7-8, 1941. G. A. Dick, dean, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.

Oregon State Veterinary Medical Association. Forest Grove, Ore. January 8, 1941. T. Robert Phelps, secretary, 1514 Washington St., Oregon City, Ore.

Kansas Veterinary Medical Association. Kansas State College, Manhattan, Kan. January 8-9, 1941. Charles W. Bower, secretary, 1128 Kansas Ave., Topeka, Kan.

Cornell University Annual Conference for Veterinarians. New York State Veterinary College, Ithaca, N. Y. January 8-10, 1941. W. A. Hagan, dean, New York State Veterinary College, Ithaca, N. Y.

Ohio State Veterinary Medical Association. Deshler-Wallick Hotel, Columbus, Ohio. January 8-10, 1941. R. E. Rebrassier, secretary, The Ohio State University, Columbus, Ohio.

Intermountain Livestock Sanitary Association. Newhouse Hotel, Salt Lake City, Utah. January 13-15, 1941. W. H. Hendricks, secretary, 1419 E. 17th South St., Salt Lake City, Utah.

New Jersey, The Veterinary Medical Association of. Hotel Hildebrecht, Trenton, N. J. January 15-16, 1941. J. R. Porteus, secretary, P. O. Box 938, Trenton, N. J.

Tennessee Veterinary Medical Association. Noel Hotel, Nashville, Tenn. January 20-21, 1941. A. C. Topmiller, secretary, 530 W. Main St., Murfreesboro, Tenn.

District of Columbia Veterinary Medical Association. Mayflower Hotel, Washington, D. C. January 21, 1941. Wm. M. Mohler, secretary, 5508 Nebraska Ave., N. W., Washington, D. C.

Illinois State Veterinary Medical Association. Springfield, Ill. January 23-24, 1941. C. C. Hastings, secretary, Williamsville, Ill.

Michigan State College Post-Graduate Conference for Veterinarians. Michigan State College, East Lansing, Mich. January 27-February 1, 1941. Ward Giltner, dean, Division of Veterinary Science, Michigan State College, East Lansing, Mich.

Ontario Veterinary Association. Royal York Hotel, Toronto, Ont. January 30-31, 1941. W. J. Rumney, secretary, 612 King St., W., Hamilton, Ont.

State Board Examinations

Illinois State Board of Veterinary Examiners. Chicago, Ill. December 9-10, 1940. Applicants will secure blanks and instruction as to fee, qualification, hours and address of examination room from the Superintendent of Registration, Department of Registration and Education, Springfield, Ill.

Maine State Board of Veterinary Examiners. January 13, 1941. Further information may be obtained from the secretary, S. W. Stiles, Falmouth Foreside, Maine.

Oklahoma Board of Veterinary Medical Examiners. State Capitol Bldg., Oklahoma City, Okla. January 15-16, 1941. W. C. McConnell, secretary, Box 88, Holdenville, Okla.

DEATHS

Carl L. Briggs of Meadville, Pa., died on October 30, 1940.

Dr. Briggs was graduated from the University of Pennsylvania in 1926 and joined the AVMA the same year.

Howard H. Green of Portland, Ore., died on November 1, 1940.

Dr. Green was graduated from the State College of Washington in 1919 and joined the AVMA in 1925. Prior to his death Dr. Green was employed as a veterinary inspector in the meat-inspection division of the City of Portland.

Col. Walter Frazer (retired) of San Diego, Calif., died on Sept. 27, 1940.

Col. Frazer entered the Army as veterinarian with the 13th cavalry on January 29, 1903. On April 4, 1917, he was commissioned assistant veterinarian with the rank of first lieutenant. He reached his rank as colonel on January 29, 1929, and was retired on September 30, 1934. Col. Frazer joined the AVMA in 1908.

John T. Wilson of Pawnee, Okla., was killed in an automobile accident on November 4, 1940.

Dr. Wilson was graduated from Kansas State College in 1910 and joined the AVMA in 1929. Mrs. Wilson also was killed in the accident.

Sherman E. Bitler (Ont. '09) of Watsontown, Pa., died on October 9, 1940.

W. J. Southey (Amer. '98) of Bridgeport, Conn., died on October 13, 1940. Dr. Southey was known as the dean of Fairfield county veterinarians. He was twice president of the Connecticut Veterinary Medical Association and was widely known as a circus veterinarian.

James E. Ewers (K.C.V.C. '10) of Los Angeles, Calif., died on September 15, 1940.

Charles P. Brown (McK. '07) of Bloomfield, Ky., died on October 8, 1940.

Harvey E. Punchard (K.C.V.C. '16) of Lakewood, Colo., died on October 26, 1940.

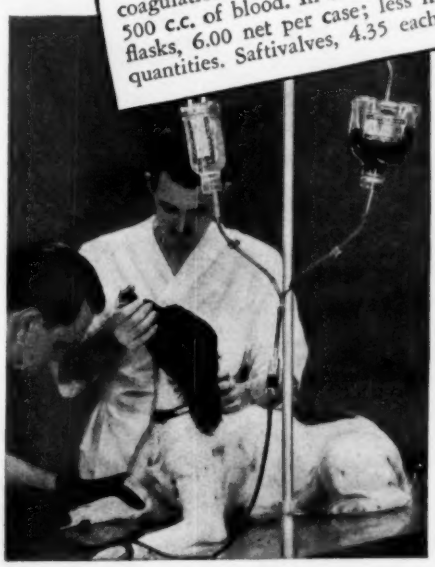
O. J. Phillips (Ont. '00) of Schulenburg, Texas, died on October 24, 1940.

A. C. Worms (Chi. '96) of Chicago, Ill., died after a long illness on November 7, 1940.

He was a former member of the Illinois State Board of Veterinary Examiners and was veterinarian for the Lincoln Park Zoölogical Garden.

After the needle is inserted in donor's jugular the valve is opened — and the high vacuum, under which the flask has been sealed at the Cutter Laboratories, sucks the desired amount of blood into the flask.

Cutter vacuum flasks are supplied with sufficient citrate to prevent coagulation of either 250 c.c. or 500 c.c. of blood. In cases of six flasks, 6.00 net per case; less in quantities. Saftivalves, 4.35 each.



Blood Transfusion for Animals Made Practical by New Cutter Technique

At last a simple, safe, professional technique for blood transfusion in the veterinary field.

The Cutter Saftivalve and Saftivac transfusion outfit, developed for human blood transfusion, has proven a "natural" in the hands of the veterinarian. Properly transfused whole blood is dramatically effective in the treatment of such infectious diseases as calf scour, navel ill, and canine distemper, and is less expensive than the use of stock serum. It is, of course, specific in the treatment of hemorrhage or shock due to surgery or traumatic injury.

Here is an extremely inexpensive professional apparatus, of real value both in the handling of large animals in the field and small animals in the hospital. Available from Cutter distributors and branch offices.

CUTTER LABORATORIES Berkeley, Chicago, New York

The citrated blood may be "banked" or immediately transfused alone or in conjunction with dextrose and saline solution.

Animals That Make the News

Fox Terrier Survives Coast-to-Coast Trip Without Food or Water

A Fox Terrier bitch survived a two-week trip from Republic, Wash., to New York City in a sealed boxcar without food or water. She was turned over to the shelter of the ASPCA where Dr. R. J. Garbutt administered classical treatment for the dying, dehydrated animal. After receiving glucose and salines, the dog's condition was reported to be "quite promising."

Don't Abandon Pets

The arrival of a fine St. Bernard at the home of Miss Jane Roberts, San Diego, in a dying condition from starvation after being abandoned by someone in the Cleveland National Forest makes the headlines of Southern California newspapers. The dog was ridden with insects, moribund, and too weak to recover. The plea is for folks who do not want their pets to take them to the humane society for disposal in human-like manner.

Mouse Feathers Nest with Bills from Cash Register

For quite some time bills were disappearing from the cash register of a Lombard, Ill., restaurant. Police were unable to make progress on the mystery, but the proprietor solved the case just a few days ago by putting a mouse trap in the till, baited with a dollar bill. Next morning the culprit mouse was found in the trap and, after a search, its nest was found—feathered with $35 in bills.

Hemal Homonymy Felis

"Transfusions are not often called for in veterinary practice," say Roland and McElroy in *Science News Letter*, "but if a sick cat is so valuable as to make it worth while, there would appear to be no need for the troublesome, time-consuming job of "typ-

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Animals That Make the News

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ing. . . . Any cat can be a donor." To which "Animals That Make the News" retorts: "You'd be surprised how much some cats are worth, how much some catophiles would pay for a transfusion and how hep the cat docs are to homonymy of kitty's circulating fluid."

Bear Gets Drunk on Fermented Apples; Falls on Passing Auto

As a motorist in Monticello, N. Y., passed under an apple tree overhanging the highway, a 300-lb. bear crashed onto the top of his automobile. The impact nearly upset the car, and the bear rolled to the ground apparently motionless. The motorist, Vince Toomey, a power company employé, hurried home to get his gun, but upon returning found that the bear had revived and disappeared.

Toomey avers that the bear was drunk. A recent cold wave, he explained, froze the apples, causing them to ferment, and the bear ate so many that he became drunk on "applejack."

London Swans Get Scrubbing After Oil Drench from German Bombs

Thirty of the swans which swim on the Thames River in London recently got a soap and water bath because their feathers had become clogged with oil from German bombs which fell into the river.

Expert Chicken Picker Picks and Picks and Picks to Work Out Fine

A few days before Thanksgiving the policemen of Joliet, Ill., bought some chickens from farmers obliged to evacuate a district where a munitions center will be built. They got the fowls at a bargain, but their problem was how to get them picked. Fortunately, Gus Wendell, 54, a frequent visitor to the police court, was brought in again, just at the right time. When sobered up enough to appear in court, Gus was asked his trade. He replied, "I'm an expert

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Animals That Make the News

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chicken picker, but I can't pay my fine." That didn't baffle the court, however, for Gus was put to work on the policemen's chickens—100 of them at the rate of 5 cents apiece in lieu of a $5 fine.

Bird Raises Family in Auto

A mechanic working in a Staunton, Va., garage found a bird's nest with four eggs tucked away in the chassis of a car which the owner uses daily.

"Non-Cub" Year at Yosemite, So Bears Behave Well

Because this is a "non-cub" year at Yosemite National Park, and due to the fact that rangers have taken greater precautions, only two persons were injured by bears during the 1940 season.

Years in which large numbers of cubs are born in the park have been each odd

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Animals That Make the News

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year during the past decade or so and, according to Park Superintendent Lawrence C. Merriam, in these years more visitors get into trouble with the bears because of the mother bears' nervousness regarding their young.

Rattlesnakes Add to Farmer's Income

Rattlesnakes have provided an added source of income for John Cok, a truck farmer of Willard, Ohio. Cok has shown his workers how to handle the snakes and asked them to "bring 'em in alive" instead of killing them. He keeps them in his vegetable house until he finds a market for them. Last year he sold 14 to the Cleveland Museum of Natural History.

A 1,000-lb. sow inflicted severe injury to H. A. White, veterinarian of Wyoming, Ill., when he tried to enter the pen to vaccinate her. Bruises about the head including blackened eyes were sustained before the owner could beat off the ferocious beast. Just the same the sow got her dose of serum and virus from the injured doctor.—*From Toulon (Ill.) News.*

To the animals of the world used for transport, add 3 million camels, granted that the census taker of *Science News Letter* counted them right.

An Associated Press report, originating in Melbourne, Australia, under date of October 26, tells of a little dog named Conty Bright Heroic that did its part during Australia's Comforts Fund day, allowing itself to be patted 2,500 times at a penny a pat.

A recent codification of an 18-year accumulation of municipal enactments in Fort Lauderdale, Fla., revealed that it is illegal to own a dog that howls and that all horses must be equipped with horns and tail-lights, according to a United Press report.

For Relapses

when low blood serum Magnesium accompanies low blood serum Calcium, complicated by Ketosis, as observed in some Milk Fever cases that relapse after injections of Calcium Gluconate—

USE JEN-SAL *D-C-M Solution*

A stable solution containing 3½ ounces Dextrose, 3-7/10 ounces Calcium Borogluconate, and 2/3 ounce Magnesium Borogluconate per 500 c.c., with traces of Phosphates.

Each 500 c.c. of Jen-Sal D-C-M solution is the equivalent of 350 c.c. of C-B-G Solution (25.7% Calcium Borogluconate), 200 c.c. of Jen-Sal 50% Dextrose Solution, and 500 c.c. of 6.5% Magnesium Borogluconate Solution.

The clinical picture of the true Milk Fever case merges into that seen in cases of low serum Magnesium so that no clear-cut distinction is possible, but these cases which relapse may show a lowered serum Magnesium.

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